TECHNOLOGY DEPT.

December 11, 1940

NATIONAL PETROLEUM NEWS

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DEC 12 1940
DETROIT

LUBRICATION PROBLEMS ABSORB A.S.M.E. AT ANNUAL MEETING

Increase in load capacity of a bearing in laboratory tests show importance of high surface finish. Industrial lubrication complicated by additive oils. Page R-438

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NEW IMPROVED THERMOFOR KILN FOR PERCOLATION FILTRATION

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SOLUTIZER SWEETENING HOLDS INHIBITOR SUSCEPTIBILITY

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Two independent refiners cut Gulf Coast crudes 1 to 20c per bbl. Page 13.

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West-East rail rate cut on fuel oil holds attention of many oil men as tanker rates rise to 80c a bbl. on No. 2 fuel. Page 13.

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Bureau of Mines official predicts domestic demand 8 to 9% increase for all refined products during 1941. Page 23.

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Canada may bar all Penn lube oils under new import licensing plan; independent jobbers hardest hit. Page 15.

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Interstate Oil Compact 'revitalized' for submission to Congress. Page 22.

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Texas commission calls emergency proration hearing after crude price cuts. Page 13.

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* * *

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* * *

State court holds oil marketer is not subject to Federal Wage-Hour Law. Page 13.

REFINING TECHNOLOGY EDITION

SPEEDY

FUEL OIL DELIVERY

Morrison fuel oil hose nozzles are noted for their speed of delivery and sure tight closing action.

Light, convenient, and easy to manipulate, these Morrison self closing nozzles are popular with fuel oil delivery men. The drivers like the smooth action and the clean cut tightness after the nozzles are closed.

A variety of these nozzles is made to meet every delivery problem.

Fuel oil deliveries are made simpler, safer, and faster with the Morrison fuel oil hose nozzles.

MORRISON BROS. COMPANY

OIL EQUIPMENT HEADQUARTERS

DUBUQUE, IOWA

COMING MEETINGS

DECEMBER

Mid-Continent Oil & Gas Assn., Annual Meeting of General Board of Directors, Tulsa Club Roof, Tulsa, Okla., Mon., Dec. 16.

JANUARY, 1941

SAE Annual Meeting (and Engineering Display), Book-Cadillac Hotel, Detroit, Mich., Jan. 6-10.

Liquefied Petroleum Gas Assn., Eastern Section, Regional Meeting, N. Y., N. Y., Jan. 16-17.

Compressed Gas Manufacturers Assn., Inc., Annual Meeting, N. Y., N. Y., Jan. 20-21.

Oil Trades Assn. of New York, Quarterly Meeting and Dinner, Waldorf-Astoria, New York, Jan. 21.

Northwest Petroleum Assn., Radisson Hotel, Minneapolis, Minn., Jan. 23-24.

FEBRUARY, 1941

Suppliers and Equipment Exposition, Tennessee Oil Men's Assn., Hotel Peabody, Memphis, Tenn., Feb. 2-4.

Wisconsin Petroleum Assn., Annual Convention, Milwaukee, Wis., Feb. 11-13.

Kentucky Petroleum Marketers Assn., 15th Annual Meeting and Convention, Brown Hotel, Louisville, Ky., Feb. 18-19.

American Institute of Mining & Metallurgical Engineers, Engineering Societies building and Commodore Hotel, New York, Feb. 17-20.

Illinois Petroleum Marketers Assn., Annual Convention and Exhibit Show, Hotel Faust, Rockford, Ill., Feb. 18-20.

North Texas Oil & Gas Assn., Wichita Falls, Tex., Feb. 22.

Liquefied Petroleum Gas Assn., Inc., Annual Convention, Chicago, Ill., Feb. 24-25.

Iowa Independent Oil Jobbers Assn., Des Moines, Ia., Feb. 26-28.

American Petroleum Institute, Division of Production, Southwestern District, Washington-Youree Hotel, Shreveport, La., Feb. 27-28.

MARCH, 1941

Ohio Petroleum Marketers Assn., Deshler-Wallick Hotel, Columbus, Ohio, March 4-6.

American Society for Testing Materials, Hotel Mayflower, Washington, D. C., March 3-7.

National Dixie Distributors, Inc., Fort Worth, Tex., March 10.

American Petroleum Institute, Division of Production Spring Meeting, Pacific Coast District, Biltmore Hotel, Los Angeles, Calif., March 11.

Indiana Independent Petroleum Assn., 1941 Spring Convention & Refiners' & Suppliers' Exhibit, Hotel Severin, Indianapolis, Ind., March 11--13.

Oil Burner Institute, Progress Exhibition, Commercial Museum, Philadelphia, Pa., March 17-22.

Oil Trades Assn. of New York, Annual Meeting, Waldorf-Astoria, New York, March 25.

APRIL, 1941

American Assn. of Petroleum Geologists, 26th Annual Meeting, Rice Hotel, Houston, Tex., April 2, 3 and 4.

American Chemical Society, St. Louis, Mo., April 7-11.

Western Petroleum Refiners Assn., Arlington Hotel, Hot Springs, Ark., April 16-18.

American Petroleum Institute, Division of Production, Wm. Penn Hotel, Pittsburgh, Pa., April 17-18.

Petroleum Industry Electrical Assn., Tulsa, Okla., April 23-25.

Natural Gasoline Assn. of America, Annual Convention, Baker Hotel, Dallas, Texas, April 23-25.

National Petroleum Assn., semi-annual Meeting, Hotel Cleveland, Cleveland, O., April 25-26.

Petroleum and Natural Gas Conference, State College, Pa., April 25-26.

MAY, 1941

American Petroleum Institute, 11th Mid-Year Meeting, Mayo Hotel, Tulsa, Okla., May 19-23.

JUNE, 1941

American Society for Testing Materials, 44th Annual Meeting, Palmer House, Chicago, Ill., June 23-27.

SEPTEMBER, 1941

American Chemical Society, Atlantic City, N. J., Sept. 8-12.

NOVEMBER, 1941

American Petroleum Institute, 22nd Annual Meeting, San Francisco, Calif., Nov. 3-7.

NATIONAL PETROLEUM NEWS

DECEMBER 11, 1940

NEWS

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THIS WEEK WITH NPN

NPN FOR GIFTS!

With the merry jingle of Santa's bells growing stronger every day, you're probably worrying about Christmas gifts. After you've taken care of that gift for the little woman and the rest of the family, there's the question of gifts for your oil men friends and business associates. And NPN has just the suggestion you've been looking for—a gift that is repeated 52 times a year! Give a gift subscription to NPN! And to every name you send in, we'll write a cheery Christmasy letter telling that the subscription is a Christmas gift from you. P. S. We'll start subscriptions with our Mid-Holiday Issue, dated Dec. 25. This is the issue that's full of fun and holiday spirit—guaranteed to make even the most dour mouth turn up in smiles. Better hurry—those sleigh bells are getting louder every minute!

17 YEARS AGO

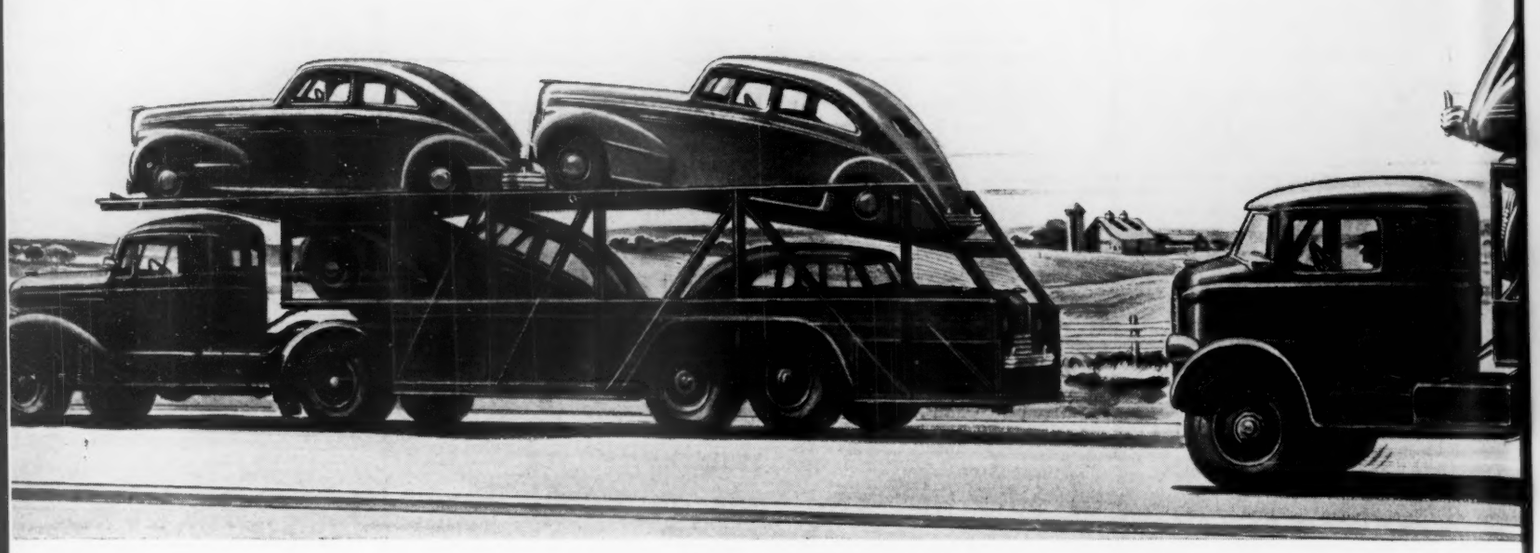
In 1923, NPN ran a photo of Thomas P. Melvin, pioneer Mid-Continent oil man. After photo was published, it was stored away in our files, and forgotten. Seventeen years later, NPN had occasion to recall that photo, with the arrival of a note from his daughter, Nell Melvin, Tulsa nurse, who wanted a picture of her father. Mr. Melvin died May 26, 1939. NPN editors dug through many files, emerging triumphantly with not one, but two photos which were promptly mailed to a surprised and grateful daughter.

TUTOR

NPN receives letters regularly from students studying the Oil Industry, asking for help in preparing theses and reports. NPN, long a tutor of students interested in the oil business, notes that increasing attention is being paid to marketing by schools and universities. Such is indicated in a letter this week from a student who concludes with "I hope to show in my thesis, the function the bulk station plays in the marketing of an increasingly diversified line of products." NPN, of course, is justly proud that its facilities are being used and requested by educators and students.

ADVERTISING PAGES REMOVED

New Cars Reflect



1941 MODELS SHOW CONTINUATION OF TREND IN ENGINE DESIGN TO UTILIZE HIGHER ANTI-KNOCK GASOLINE

THE MARKED INCREASE in the compression ratios of 1941 cars —the sharpest rise in five years—is ample evidence that automobile manufacturers are keeping pace with advances in gasoline anti-knock quality. The compression ratios for all makes and models of 1941 cars average 6.66 to 1, as against 6.43 to 1 for 1940. At least twenty-five of the new models have higher compression ratios than they did last year, and some manufacturers who have not increased their already high compression ratios have made other changes in engine design to obtain additional horsepower from today's greatly improved fuels.

How closely increases in engine efficiency have paralleled gains in gasoline anti-knock value in recent years is shown in Figures 1 and 2. Improvements in motor fuel have made it possible for automotive designers to stress efficiency rather than size—a trend which in all likelihood will continue. Future developments in automotive engine designs will probably follow lines already successfully established in both automotive and aviation practice: the improvement of performance and fuel economy through further increases in compression ratios or by supercharging or both.

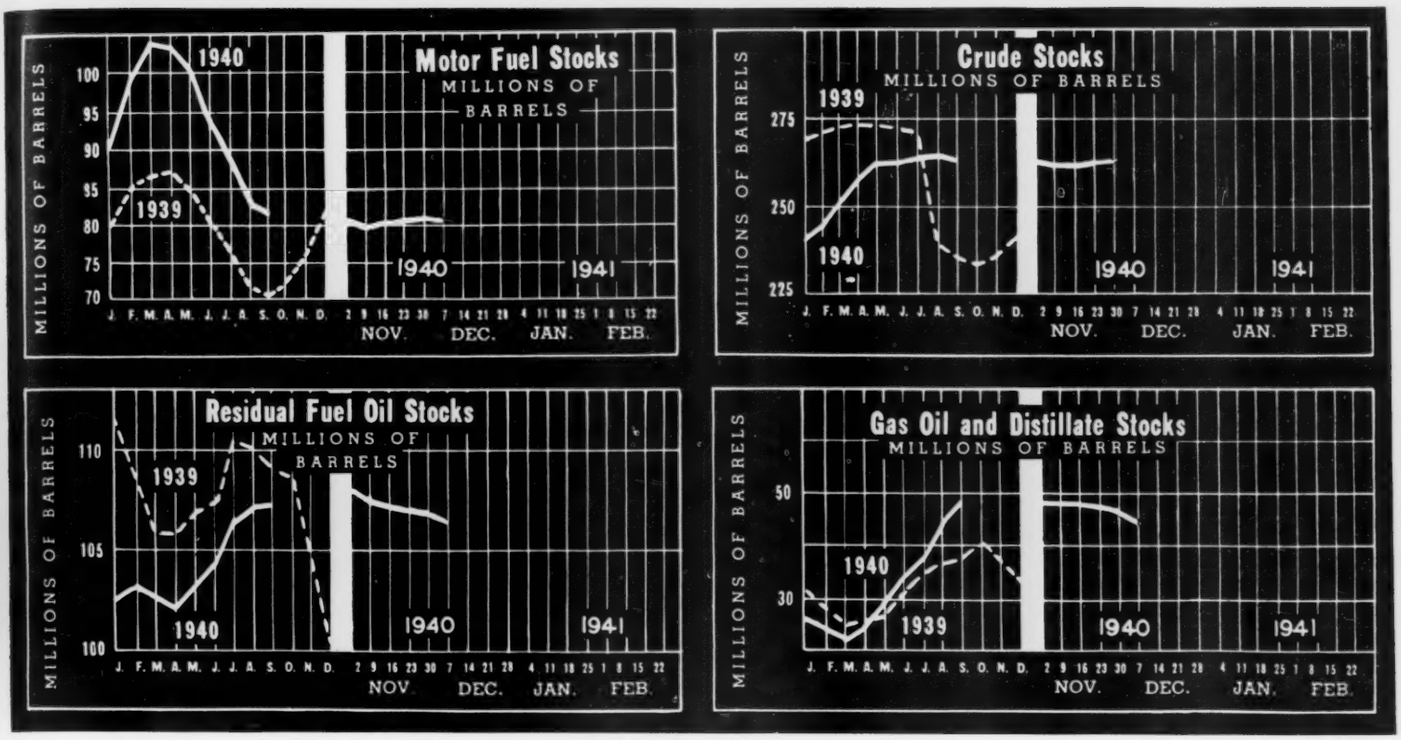
Figures 3 and 4, based on laboratory tests made on a 1940 model vehicle, show the gains in fuel economy, car speed and acceleration made possible by simultaneously raising the compression ratio from 6.1 to 1 to 8.6 to 1 and the fuel octane number from 78 to 95. And Ethyl research workers are now experimenting with engines having compression ratios above 11 to 1 and requiring fuel of over 100 octane number. Tests with supercharged engines also are being conducted. (Fig. 5.)

Engines and fuels are so closely related that their development is a joint responsibility of the automotive engineer and the petroleum technologist. Through their cooperative efforts, suitable fuels of higher anti-knock quality will be produced economically for engines which will utilize them with greatest efficiency.

We of the Ethyl Gasoline Corporation, through our research laboratories in Detroit and San Bernardino, are actively cooperating with engine designers in making the best possible use of tomorrow's fuels and with fuel refiners in producing gasolines best suited to the engines of tomorrow.

ETHYL GASOLINE CORPORATION, *Chrysler Building, New York, N.Y.*

·STATISTICS·



A. P. I. Weekly Refinery Report

(Figures in Thousands of Barrels of 42 Gallons Each)

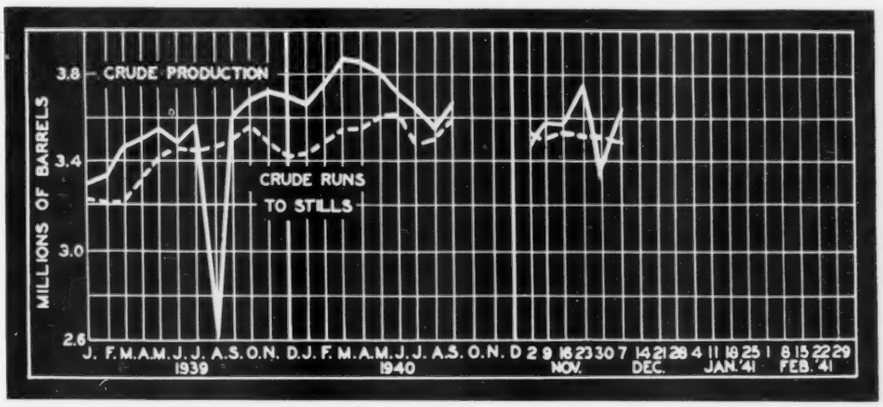
Districts	Daily Average Crude to Stills Week Ended		Per Cent of Reporting Capacity Operated Week Ended		†Gasoline Production Week Ended		Total Stocks Finished and Unfinished Motor Fuel‡ Week Ended		Total Stocks of Gas Oil & Distillates Week Ended		Total Stocks of Residual Fuel Oil Week Ended	
	Dec. 7	Nov. 30	Dec. 7	Nov. 30	Dec. 7	Nov. 30	Dec. 7	Nov. 30	Dec. 7	Nov. 30	Dec. 7	Nov. 30
East Coast	542	553	84.3	86.0	1,435	1,450	17,325	17,409	15,688	16,482	11,883	12,512
Appalachian	122	112	85.9	78.9	425	451	3,229	3,161	550	570	337	345
Ind., Ill., Ky.	547	552	81.6	82.4	2,205	2,209	13,569	13,709	5,076	5,443	3,107	3,324
Okla., Kans., Mo.	253	262	78.3	81.1	§915	§958	6,609	6,541	1,407	1,461	2,170	2,228
Inland Texas	122	112	73.1	67.1	481	466	1,643	1,647	421	409	1,588	1,542
Texas Gulf	856	852	89.6	89.2	2,709	2,568	12,923	12,563	8,326	8,702	8,520	8,465
La., Gulf	132	118	82.5	73.8	347	344	2,779	2,520	1,435	1,448	2,131	2,128
No. La., Ark.	44	41	84.6	76.9	111	113	463	460	330	331	479	495
Rocky Mt.	47	51	69.1	75.0	224	206	992	929	140	139	427	431
California	455	520	62.3	71.2	1,362	1,464	15,852	15,815	9,987	10,227	72,906	73,328
Total Reporting	3,120	3,173	79.8	81.2	10,214	10,229	75,382	74,754	43,360	45,212	103,548	104,798
U. S. Total**	3,460	3,510			11,489	11,503	81,062	80,284	44,305	46,212	105,353	106,618
U. S. Total 12-7-39**	3,414				11,657		78,162		36,946		109,290	

†Includes straight-run, cracked and natural blended. ‡Includes stocks at refineries, in bulk-terminals, pipe lines and in transit. §12% of reporting capacity in this district did not report gasoline production. **Estimated, U. S. Bureau of Mines basis. *Revised.

Crude Oil Production for the U. S.

(American Petroleum Institute figures)

	WEEK ENDED Dec. 7 Barrels	Nov. 30 Barrels
Oklahoma	422,050	403,550
Kansas	183,100	196,650
Nebraska	2,350	2,550
Texas	1,344,600	1,089,350
Louisiana	289,150	286,350
Arkansas	68,700	69,400
Mississippi	17,200	16,000
Illinois	334,850	327,400
Indiana	21,150	20,550
Eastern (Ill. and Ind. excluded)	87,050	89,250
Michigan	45,150	46,350
Wyoming	70,450	72,650
Montana	18,150	17,800
Colorado	3,550	3,500
New Mexico	101,100	101,100
California	604,000	592,600
Total U. S.	3,612,600	3,335,050
Crude Imports	155,590	132,430
Total New Supply	3,768,190	3,467,480



TEXACO DEVELOPMENT CORPORATION

PATENT LICENSES IN THE PETROLEUM INDUSTRY

TEXACO DEVELOPMENT CORPORATION

A Subsidiary of The Texas Corporation

26 Journal Square • Jersey City, N. J.

•STATISTICS•

N.P.N. Gasoline Index

	Dealer T.W. Cents Per Gallon	Tank Car Cents Per Gallon
Dec. 9	8.53	5.03
Month ago	8.71	5.06
Year ago	9.60	6.21

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 9 wholesale markets for regular-grade gasoline.

Weekly Changes in Crude Oil Stocks*

(Thousands of barrels)

Grade or origin	Nov. 23	Nov. 30	Chge. from Nov. 23
Pennsylvania Grade	†4,470	4,364	—106
Other Appalachian	1,403	1,341	— 62
Lima-Michigan	1,350	1,346	— 4
Illinois-Indiana	19,985	20,313	+328
Arkansas	3,821	3,802	— 19
Kansas	8,394	8,200	—194
Louisiana:	14,321	13,897	—424
Northern (inc. Mississippi)	5,484	5,359	—125
Gulf Coast	8,837	8,538	—299
New Mexico	7,286	7,470	+184
Oklahoma	63,596	63,704	+108
Texas:	84,683	85,212	+529
East Texas	18,558	19,313	+755
West Texas	19,000	18,902	— 98
Gulf Coast	20,263	20,632	+369
Other Texas	26,862	26,365	—497
Rocky Mountain	15,448	15,735	+287
California	34,310	34,564	+254
Foreign	2,613	2,731	+118
Total U. S. refinable	†261,680	262,679	+999
Heavy in California	12,032	12,031	— 1

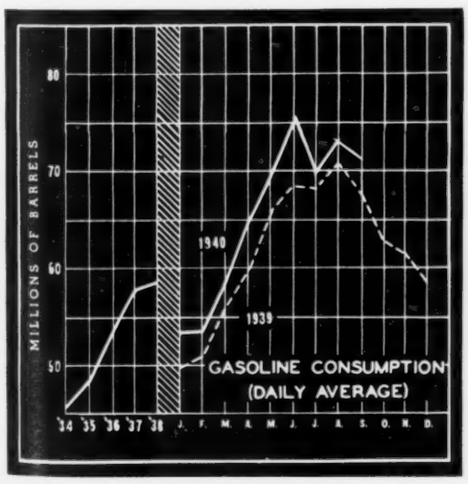
†Revised. *As compiled by U. S. Bureau of Mines.

Western Petroleum Refiners Association gasoline statistics for the month of October, covering 39 companies operating 47 plants in the Mid-Continent area; and for twelve months preceding:

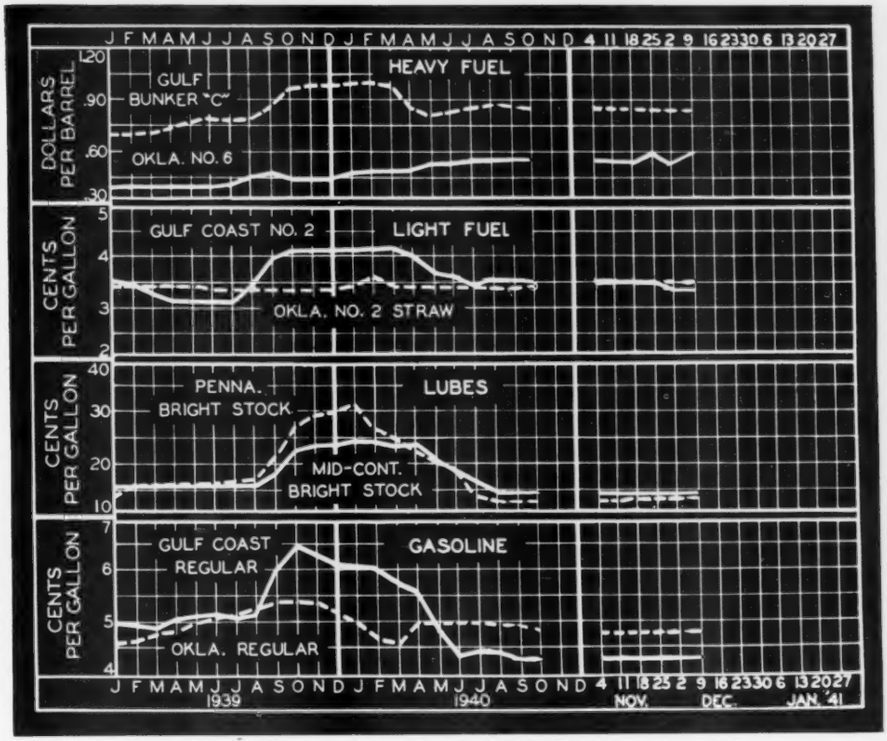
(All figures are in barrels of 42 gallons)

1939	Gasoline Production	Gasoline Shipments	Inventory End of Mo.
October	8,264,590	7,700,963	6,170,546
November	7,837,061	7,137,748	6,779,585
December	7,619,264	6,627,916	7,770,933
1940			
January	7,149,056	5,942,024	8,977,965
February	6,709,485	5,640,875	10,046,575
March	7,010,741	6,815,595	10,241,721 / 7,436,721*
April	5,702,968*	6,198,006*	6,941,683†
May	6,283,212	6,687,474	6,537,421
June	6,407,822	7,620,968	5,324,275
July	6,123,869	6,281,725	5,166,419
August	6,266,292	6,833,309	4,599,402
September	6,335,313	6,343,765†	4,590,950†
October	6,360,109	6,622,115	4,328,944

*One less company reporting than previously.
†Revised account of reclassification.



REFINERY TANK CAR PRICES



Gasoline Consumption by States, September 1940

(Figures in thousands)

	Months of Sept., 1940 Gallons	Months of Sept., 1939 Gallons	% of Change	9 Months Ending With Sept., 1940 Gallons	9 Months Ending With Sept., 1939 Gallons	% of Change
Alabama	22,895	22,154	+ 3.34	193,391	182,586	+ 5.92
Arizona	9,091	8,763	+ 3.74	84,782	79,062	+ 7.23
Arkansas	16,769	16,693	+ 0.46	138,686	133,189	+ 4.13
California	163,236	160,186	+ 1.90	1,433,869	1,370,419	+ 4.63
Colorado	21,698	20,813	+ 4.25	191,679	181,748	+ 5.46
Connecticut	33,910	32,225	+ 5.23	277,505	262,829	+ 5.58
Delaware	5,656	5,338	+ 5.96	47,185	44,188	+ 6.78
District of Columbia	14,496	13,038	+11.18	122,110	111,601	+ 9.42
Florida	28,598	26,522	+ 7.83	299,908	271,468	+10.48
Georgia	33,913	30,681	+10.53	288,356	265,532	+ 8.60
Idaho	10,373	10,296	+ 0.75	80,548	74,633	+ 7.93
Illinois	132,114	127,678	+ 3.47	1,125,322	1,052,606	+ 6.91
Indiana	62,804	59,766	+ 5.08	536,395	486,739	+10.20
Iowa	48,648	48,255	+ 0.81	431,582	414,182	+ 4.20
Kansas	46,365	38,934	+19.09	391,795	372,116	+ 5.29
Kentucky	25,047	24,851	+ 0.79	213,660	203,614	+ 4.93
Louisiana	23,227	22,702	+ 2.31	200,591	190,081	+ 5.53
Maine	15,323	15,412	— 0.58	118,982	114,157	+ 4.23
Maryland	27,644	27,155	+ 1.80	233,022	217,673	+ 7.05
Massachusetts	65,054	66,022	— 1.47	553,304	539,190	+ 2.62
Michigan	107,593	102,244	+ 5.23	929,984	857,156	+ 8.50
Minnesota	71,040	53,752	+32.16	441,724	413,225	+ 6.90
Mississippi	20,859	18,349	+13.68	160,241	152,763	+ 4.90
Missouri	62,282	58,685	+ 6.30	513,232	485,761	+ 5.66
Montana	12,164	12,004	+ 1.33	106,448	96,883	+ 9.87
Nebraska	18,506	20,837	—11.19	177,411	176,872	+ 0.30
Nevada	4,286	4,314	0.65	33,138	33,777	— 1.89
New Hampshire	8,844	9,323	— 5.14	72,106	70,711	+ 1.97
New Jersey	80,060	79,909	+ 0.19	684,970	653,190	+ 4.87
New Mexico	9,881	8,938	+10.55	82,512	76,037	+ 8.52
New York	178,231	174,884	+ 1.91	1,472,737	1,426,404	+ 3.25
North Carolina	40,779	38,254	+ 6.60	332,925	317,699	+ 4.79
North Dakota	15,627	13,615	+14.78	122,268	103,400	+18.25
Ohio	127,770	123,989	+ 3.05	1,090,365	1,017,932	+ 7.12
Oklahoma	40,053	36,845	+ 8.71	335,281	322,922	+ 3.83
Oregon	24,345	23,117	+ 5.31	198,979	184,584	+ 7.80
Pennsylvania	139,084	137,207	+ 1.37	1,170,302	1,098,716	+ 6.52
Rhode Island	11,550	11,812	— 2.22	99,887	96,703	+ 3.29
South Carolina	19,785	18,510	+ 6.89	171,361	158,058	+ 8.42
South Dakota	12,801	12,029	+ 6.42	111,767	101,904	+ 9.68
Tennessee	31,065	22,550	+37.76	243,743	216,732	+12.46
Texas	122,637	113,923	+ 7.65	1,058,577	1,005,121	+ 5.32
Utah	9,717	9,311	+ 4.36	80,074	74,434	+ 7.58
Vermont	6,637	6,956	— 4.59	53,320	51,423	+ 3.69
Virginia	37,749	35,985	+ 4.90	305,765	286,046	+ 6.89
Washington	33,514	32,175	+ 4.16	285,672	263,925	+ 8.24
West Virginia	20,193	20,974	— 3.72	161,757	151,544	+ 6.74
Wisconsin	54,219	52,659	+ 2.96	444,915	425,592	+ 4.54
Wyoming	6,162	6,380	— 3.42	54,457	51,642	+ 5.45
Total	2,134,394	2,037,014	+ 4.78	17,958,590	16,938,769	+ 6.02
Daily Average	71,146	67,900	+ 4.78	65,542	62,047	+ 5.63
Change from previous year:						
Total change	+97,380			+1,019,821		
Percentage change in daily av..	+ 4.78%			+ 5.63%		

H. L. Thatcher

● H. L. Thatcher, Chattanooga, new president of the Tennessee Oil Men's Assn., says he "entered the oil marketing business through the side door."

In 1912, Mr. Thatcher became connected with the Southern Well Works Co., later the Lucy Manufacturing Corp. of Tennessee.

Resigning as secretary-treasurer of this company in 1924, he opened the Chattanooga territory for The Texas Co. as commission agent. In 1932, he left Texaco and became distributor for Pure Oil Co. of Tennessee.

Mr. Thatcher is now president of H. L. Thatcher, Inc., wholesale distributor for Pure Oil products. Operations cover a radius of about 30 miles from Chattanooga, including north Georgia.

NATIONAL PETROLEUM NEWS

VOLUME 32 WEDNESDAY, DECEMBER 11, 1940 NUMBER 50

Gulf Coast Crudes Cut by 2 Refiners, Not Met by Majors

HOUSTON, Tex., Dec. 9.—Two independent refiners, Republic Oil Refining Co. and Amsco Pipe Line Co., late last week announced reductions in their posted prices for Gulf coastal crudes they buy.

Purchases of the two companies total approximately 30,000 bbls. daily. The revised postings represent deeper cuts in higher gravity oils, with lesser reductions in heavy grades.

Republic led out with reductions of from 1 to 20c a bbl. for the 2 types of oil it buys. New posted prices for crudes in the Benevides, Longhorn, Southland, Sweden and Heyser fields range from 88c for 20-20.9 gravity, with 1c differential for each degree of gravity to $1.08 for 40 and above.

For Saxet, Plymouth, Midway, East White Point and Minnie Bock crudes, new postings range from 93c for 20-20.9

(*Continued on page* 20)

Texas Calls Hearing After Oil Price Cut

Special to N. P. N.

AUSTIN, Dec. 7. — Oil and political circles in Austin are looking forward interestedly to Texas Railroad Commission's state-wide emergency proration hearing here on Dec. 11.

This meeting, coming shortly after the commission set a new 60-day production order, was called according to Chairman Lon A. Smith, because the commission has been deluged with requests for increased allowable production to meet reported demand.

To Question Oil Purchasers

Chairman Smith said the commission has decided it would again ask purchasing companies for information about their nominations. Reports here are that the commission will question purchasers about their nominations for December and January.

Purchase nomination submitted in last state-wide hearing totaled 1,700,000 bbls. daily, compared with Bureau of Mines estimate of Texas demand of 1,277,000 bbls. daily.

Provoked at Price Cut

The Commission was plainly provoked at crude prices being cut on one hand and gasoline

(*Continued on page* 20)

Rate Cuts Protested

Although most eastern major companies have held off, several majors have asked Interstate Commerce Commission to suspend proposed 42% reduction in rail rates on crudes and fuel oil from Mid-West to eastern seaboard. Reasons urged by these majors against rate cuts are summarized on page 24.

Rate Cut Threatens East Coast Markets

N. P. N. News Bureau

CLEVELAND, Dec. 10.—Proposed 42% reduction in rail freight rates on crude and fuel oil from the Mid-West to eastern seaboard is a move by the rails to recover long-haul tonnage lost years ago to tankers and other forms of transportation. This was revealed in a letter by one large railroad's vice president to an oil company traffic manager who had protested to the road against the proposed rate cuts.

"In presenting this proposal the railroads were influenced almost entirely by the fact that long-haul movements of fuel oil have practically, if not entirely, disappeared from the rails", the rail executive wrote.

"In 1939 our movement of fuel oil was 122% of that in 1928, but the revenue was only 68% of that in 1928", his letter continued, adding, "the publication of these rates represented an honest effort on the part of the railroads to regain a small portion of the long-haul fuel oil traffic from refineries in the interior to consuming points at markets which they believe are rightfully theirs".

However, since the rails lost out on movement of crude and fuel to eastern seaboard from inland points of origin, oil companies on the East Coast have turned to new sources of supply and non-rail transportation —mostly tankers hauling from the Gulf, at present.

While several of the larger companies in the East told NATIONAL PETROLEUM NEWS Dec. 10—last day for filing protests—that they would not fight the railroads efforts to regain a portion of the long-haul fuel oil and crude tonnage, the applica-

(*Continued on page* 23)

FDR Asks Oil Law Citing "Emergency"

By Teletype
N. P. N. News Bureau

WASHINGTON, Dec. 11.—Federal oil control and national defense problems of the petroleum industry will be the subjects of a 3-day congressional hearing called for next Monday, Dec. 16, at the request of President Roosevelt, Chairman Cole of the House Oil Investigating Committee announced today.

The President has written Congressman Cole a confidential letter in which the Chief Executive declared that in view of the international situation, and its effect on the world oil supply, an urgent and critical need has arisen for federal oil control legislation, Chairman Cole said.

Describing the hearings as a "grand finale" to the extensive investigations conducted by his committee, Mr. Cole said that during the 3-day session his group will hear a list of witnesses, including Edward M. Stettinius, National Defense Advisory Commission member; Dr. R. E. Wilson, NDAC oil advisor, and representatives of the Interior Department and the Association of American Railroads.

Seek 'Broad Picture'

Hearings are intended to provide the committee with a broad picture of what oil control has been made necessary in the interests of national security, and problems generally of the petroleum industry brought on by the national defense program, Congressman Cole stated.

Having obtained this picture, Committee Chairman said the committee will then decide whether it will go out of existence or continue its investigations in the next Congress, whether the

(*Continued on page* 14)

State Court Holds Marketer Exempt Under Wage-Hour Law

N. P. N. News Bureau

CLEVELAND, Dec. 9. — Thoni Oil Co., the independent oil marketer of Nashville, Tenn. that took into state court the "threats" of federal wage-hour officials, has won a declaratory judgment that it is "engaged in a retail establishment" and so exempt from the wage-hour law.

A representative of the Wage-Hour Division of the U. S. Labor Department was in the courtroom during trial of the case Dec. 6 but did not intervene. Decision was by Chancellor James B. Newman in Chancery Court, Part Two, sitting at Nashville.

Thoni's petition, for a declaratory judgment that the company was not subject to the federal law, named a number of its employes as defendants. Some employes, according to the petition, had been "induced" to go before the wage-hour office in Nashville and make complaint for wages allegedly due under the wage-hour law.

The Nashville marketer, according to its petition, has a trackside station with bulk storage from which deliveries are made by tank truck to its retail stations. Employes working at these company stations also drive the tank truck between bulk storage and their respective stations, loading and unloading, too. But more than 50% of their working time is spent in "helping other employes in and about the retailing of 'gas' and oil at the stations." Emil Thoni (one of the partners) is employed by the company to do the actual unloading of tank cars and piping their contents to bulk storage, the petition said. Other employes

do not handle the gasoline until after it has come to rest in the bulk storage tanks. Tank car shipments come from refiners outside the state.

The Thoni company, according to its petition, was "informally cited" by federal wage-hour officials to show cause why it should not pay the employes' claims under the wage-hour law. (Complete text of the Thoni company's petition was published in NPN, Nov. 27, 1940 at pages 14-15.)

The state court held that the Thoni company was "expressly exempted" by terms of the wage-hour law's exemption for retail establishments. A cross bill by one of the employes was dismissed. Fred Mabry, one of defendant employes, filed notice of an appeal to Tennessee supreme court.

Norman Farrell, Nashville attorney, represented the Thoni company in its successful suit for a declaratory judgment.

Complete text of Chancellor Newman's decision is published below.

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Text of Tennessee Court's Decision On Oil Marketer Under Wage-Hour Law

THONI OIL COMPANY,
vs
J. W. CARRIGAN, ET AL.

In Chancery Court, Part Two,
At Nashville, Tennessee

This cause came on to be heard December 6, 1940, before Chancellor James B. Newman, on the original bill, the pro confessor heretofore regularly taken at rules against the defendants, J. W. Carrigan, Hardin Ethridge, James Hickson, J. V. Johnson, Harold Mayberry, E. M. Polk, Mitchell Polk and Melbin Settles, the answer and cross bill of the defendant Fred Mabry, the answer to the cross-bill, stipulation of fact filed in the case and argument of counsel;

From all of which the Court is of the opinion that the complainants are engaged in a retail establishment, the greater part of whose selling or business is in intra-state commerce, and that the defendants in this case are employes and that Sec. 6 and 7 of the Fair Labor Standards Act of 1938 (Sec. 206 and 207 of the U. S. Code Annotated, title 29) are not applicable to the complainants' business but their business is expressly exempt from these provisions by subdivision (a) (2) of Sec. 13 of said Act (Sec. 213 of the U. S. Code Annotated, Title 29) and the complainants are not liable to the defendants for the hours and wages fixed by the Fair Labor Standards Act, of 1938 and it is accordingly so ordered, adjudged and declared.

The Court further finds that the allegations of the cross-bill are met and denied by the answer and are not sustained by the proof and the applicable law. It is therefore so ordered, adjudged, and decreed that the cross-bill be and is dismissed.

The costs of the cause will be paid one-half by the complainants and one-half by the defendants, for which let execution issue.

To the foregoing decree of the Court the defendant, Fred Mabry, excepts, and prays an appeal to the present term of the Supreme Court sitting at Nashville, which is by the Court granted upon his executing bond as required by law or taking the pauper's oath, and he is allowed thirty days from the entry of this decree in which to perfect his appeal.

Enter:

Norman Farrell
Solicitor for Complainants
Lurton Goodpasture
Solicitor for Fred Mabry

Mines Bureau Studies Oil-from-Coal Plans

N. P. N. News Bureau

WASHINGTON, Dec. 9.—Bureau of Mines has engaged in a wide range of national defense activities during the past year, including testing of American coals to find their value as a source of motor fuel and lubricants, and a survey of aviation gasoline, Director Sayers says in his annual report to Interior Secretary Ickes.

Bureau tested coals from 7 states to find how readily they liquefy to produce motor fuel and useful byproducts of the hydrogenization process, and in co-operation with Navy engineers undertook comparative tests of the explosive properties of aviation gasolines and "dope" solvents, and thinners with petroleum ether.

Studies Oil-Gas 'Waste'

Bureau's petroleum engineers also studied energy relationships to find how the greatest amount of petroleum can be produced with the least waste of natural energy, oil and gas, Dr. Sayers said.

Subsurface and surface samples of oil and gasolines were collected from flow systems of wells and analyzed; tests were made with the Mines Bureau-API pressure core barrel, and operation of that instrument was improved; laboratory determinations of characteristics of hydrocarbon mixtures were continued.

Employes Pick Fellow Worker, Ousting Union

N. P. N. News Bureau

WASHINGTON, Dec. 9.—National Labor Relations Board in two current cases calls attention to provisions in the Wagner Labor Relations Act specifically permitting any individual, as well as any labor organization, to act as a collective bargaining representative, providing, of course, the employer has not interfered with or contributed support to such individual or union.

Cases involve plants of Nelson McCoy and Robinson-Ransbottom, pottery companies at Roseville, Ohio, where the labor board has just named individual bargaining agents following an election in which such agents won a majority of employe votes over an A. F. of L. union.

Thus, at each of the two plants, two individuals, who also happen to be employes, are now taking the place of the A. F. of L. union which heretofore had bargained collectively for the employes of the companies in question.

Individual agents were found to be eligible by the NLRB for a place on the election ballot after submission of a petition signed by a majority of the employes in each of the two plants. Petition in the Robinson-Ransbottom election read as follows:

"We, the undersigned employes of the Robinson-Ransbottom Pottery Co. of Roseville, Ohio, desire that Harry Kinnan and Raymond Williams represent us and act for us in all matters of collective bargaining in the above mentioned plant in regard to rates of pay, wages, hours of employment, working conditions, etc."

Similar petition naming two Nelson McCoy employes was filed with the Board in the case involving that company.

D. J. Studies Tidelands

WASHINGTON, Dec. 9.—Government's next move toward assuming title to the California tidelands oil is in the hands of the Justice Department, according to Admiral Woodson in the Navy Judge Advocate General's annual report.

Justice Department reports matter is being studied by its lands division, in accordance with instructions from President Roosevelt, which, Woodson says, directed that all steps in way of judicial proceedings or legislation, or both, deemed appropriate by the Attorney General be taken to assert whatever claims government may have to the petroleum deposits in submerged lands.

Presidential instructions followed filing last March of a report of an interdepartmental committee representing Attorney General, State, Navy and Interior Departments, which had been directed by the president to study question of federal v. state jurisdiction over land and mineral rights off the coasts of the United States and also of the exercise of federal jurisdiction over submerged oil lands off the coast of California.

Oil Company Asks Bill of Particulars In Government's Anti-Trust Oil Suit

N. P. N. News Bureau

WASHINGTON, Dec. 9.—Government has been granted until Jan. 15—date when answers from most of the defendants are due—to reply to the lone motion for a bill of particulars, which has been filed in the Justice Department's anti-trust suit against American Petroleum Institute, Ethyl Gasoline Corp., and 22 major oil companies and the latters' alleged affiliates.

Motion was filed by Big Lake Oil Co., Pittsburgh, listed in the complaint as having Continental Oil Co. "affiliations," and asked the District of Columbia federal district court to require the government either to submit a more definite statement, a bill of particulars, or dismiss the suit so far as Big Lake is concerned. Under the consent agreement approved by the court, the government has until the January date to file its "points and authorities" in opposition to this motion.

Charging the complaint is defective insofar as it relates to Big Lake, company alleged government has failed to state the type of business in which it is engaged—whether producing, purchasing, refining, or transportation of crude oil, or marketing of refined oil products.

Motion also asserts government has failed to say what allegedly unlawful transaction or transactions Big Lake has engaged or participated in; what instrumentalities of interstate commerce it owns, and what part of the relief asked will affect the company.

Justice Department, meanwhile, reports number of defendants involved in the suit has been reduced to 344 due to the dissolution of 23 of the 367 companies named in the complaint. All except 8 or 9 of the defendants have now been served, it was stated.

FDR Urges Oil Control Law, Says 'Emergency' Demands It

(*Continued from page* 13)

present Cole Bill or new oil legislation will be reintroduced in January, and the nature of the report committee is required to file at the conclusion of the present congressional session.

FDR Shows Renewed Interest

Congressman Cole declined to give any clue as to the decision his committee may be expected to reach, although he did say President Roosevelt had displayed a renewed and intense interest in securing federal oil control legislation without further delay.

Commissioner Stettinius and Dr. Wilson will be asked to give the committee of their views on national defense oil problems and the necessity of federal oil control as indicated by the experience of the defense commission, Congressman Cole continued.

Rails to Talk of Pipelines

Representatives of the Association of American Railroads will discuss the question of building new pipelines for national defense, he said.

Chairman Cole was reluctant to disclose the nature of the testimony Interior Department representatives will give, but they presumably will be asked to discuss federal oil control in the light of recent statements made by Interior Secretary Ickes, in which he said his department is more than ever in favor of a "federal oil conservation law" and indicated his belief that such a law should cover the industry from oil well to filling station (see NPN, Dec. 4).

Plan for staging the hearings over a 3-day period are based on Chairman Cole's belief subject matter before the committee can be covered in that time, he said.

Urged By Ickes

Decision of Chairman Cole to hold his announced hearings is due to the urgings of Interior Secretary Ickes, who has been pressing President Roosevelt for immediate action on federal oil legislation, a source close to the oil scene. This observer, however, declined to hazard a guess on outcome of the hearings, saying, "It is in the lap of the gods."

Canada's Import Licensing Avoids Gasoline Rationing

Special to N. P. N.

OTTAWA, Dec. 10.—Canadian government has been slow to get machinery for its licensing of imports of petroleum products into operation, but after the first week, reports were that they have not yet caused hardship to the oil industry.

Drastic as changes in tariff on petroleum products were in the budget Finance Minister J. L. Isley brought to the House of Commons Dec. 2, the industry is congratulating itself that the much-feared ration of gasoline and other oil products has been staved off, for the time being at least.

Changes in tariff, which are affected by the War Exchange Conservation Act, and in certain excise taxes are estimated to save Canada from 60 to 70 million dollars in U. S. dollar exchange. Trade with the U. S. will not be reduced by this amount, since these savings—and more—will be spent in U. S.

Finance Minister in his speech emphasized that it was the intention to reduce gradually the amount of imports including all petroleum products. Canadian industries using raw and semi-finished materials on this list will have to adapt themselves gradually to the use of domestic materials or materials from other sources other than the U. S., he added.

Referring specifically to petroleum products, the Finance Minister said that the oil controller was making arrangements that all Canadian petroleum requirements would be imported in the most economical form possible, and plans were going forward to see that this would be done without burden to consumers or without discrimination against those distributors who are now using imported gasoline. Gasoline importation permits, he declared, will be restricted only after equitable arrangements have been made by the oil controller for supplying these distributors.

If the domestic industry takes advantage of situation to increase prices or profits unduly, the Government is empowered to suspend import restrictions to take off duties entirely on such products and, in addition, impose on all goods imported by a transgressing importer an excise tax equivalent to the rates of the general (the highest) tariff. The new enactments expire automatically at War's end.

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Majors Not Affected

Special to N. P. N.

TORONTO, Dec. 9.—Officials of leading oil companies here do not expect licensing of oil imports to seriously affect Canadian major refiners.

Imperial Oil has lately arranged for pipeline delivery of South American crude at its Sarnia refinery. McColl-Frontenac Oil Co. has in the past few years invested large sums in producing properties in Trinidad.

British American Oil Co. has large producing properties in Oklahoma and Texas operated under a subsidiary, but its officials say it is immaterial whether its crude requirements are permitted entry from U. S. or South America, as its crude oil production of its subsidiary is readily salable in the U. S.

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Canadian Import Licensing May Bar Pennsylvania Oils

Special to N. P. N.

TORONTO, Dec. 9.—"Several hundred Canadian independent jobbers will be unable to market Pennsylvania oil inasmuch as Pennsylvania crude is not imported by Canadian refiners for processing in Canada", according to a statement by Charles E. Austin, Joy Oil Co., to NATIONAL PETROLEUM NEWS commenting on effect of licensing Canadian oil imports. "Lubricating oils to be supplied the Canadian public after Feb. 15 will be mostly refined from Peruvian, Colombian and Venezuelan crude", this independent marketer adds.

It was reported here, however, that some companies import bright stocks and neutral oils for blending in the Dominion. Whether or not such importation would be banned, depends on action of Oil Controller Cottrelle, a large oil company executive stated.

While the Dominion government indicated it has no intention of restricting the importation of crude, efforts will be made through use of licenses to divert crude oil purchased from the U. S. to other countries.

'Hits Independent Jobbers'

"The Ottawa government has also announced its intention of requiring independent Canadian jobbers to purchase all their supplies of gasoline, lubricating oils, kerosire and fuel oils, etc., from Canadian refiners," Mr. Austin said, adding, "It is expected that no licenses will be issued for the importation of U. S. refined products after Feb. 15, 1941.

All arrangements concerning prices to be paid by Canadian jobbers to the Canadian refiners for refined products are to be made by Oil Controller Cottrelle, he explained.

While the Joy company will not be affected because it purchases practically all its gasoline requirements within the British Empire, Mr. Austin predicted that many Canadian independent jobbers' outlets would be gradually absorbed by the large Canadian refiners. With competition eliminated there will undoubtedly be a gradual increase in prices to the Canadian public on all refined products, he added.

Based on Canadian Bureau of Mines figures for 1939 there will be excluded from Canada approximately $8,000,000 of U. S. refined products annually, Austin said. Based on 1939 imports, it is expected there will be diverted approximately $12,000,000 annually from purchases of U. S. crude oil to Venezuela, Peru and Colombia, he said.

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Oil Barter 'Possible,' Says State Department

N. P. N. News Bureau

WASHINGTON, Dec. 4.—Barter system providing for exchange of Canadian products for U. S. crude oil might be worked out as has been suggested in dispatches from Ottawa, State Department officials said today.

While Department has not been approached, such a proposal would cause no surprise; officials indicated, saying that Canada, being faced with a need for oil and to conserve dollar exchange, may be expected to buy crude where it is cheapest and with smallest cash outlay possible.

* * *

Turner Valley Quota Cut to 22,000 Bbls.

Special to N. P. N.

TORONTO, Dec. 7.—Despite Canada's licensing to restrict imports, allowable production for Turner Valley Field has been reduced to 22,000 bbls. daily, from November's quota of 25,000 bbls. daily, by the Alberta Petroleum and Natural Gas Convention Board.

Canada's Oil Controller Cottrelle, after his recent visit to Turner Valley, expressed hope

that production could be maintained at 25,000 bbls. daily.

In view of Mr. Cottrelle's expressed hopes that production in this area should receive government encouragement, Western Canadian oil producers are reported disappointed that the Dominion Government is not acting to subsidize drilling operations.

Venezuelan Oil Piped to Canadian Refinery

N. P. N. News Bureau

NEW YORK, Dec. 9.—First cargo of Venezuelan crude destined for Imperial Oil's refinery at Sarnia, Ontario, arrived at Marcus Hook, Pa., on Dec. 7, it was learned today from Standard Oil Co. of N. J., parent of the Canadian Oil company.

Pumps started moving the oil at noon today through pipeline to Port Huron, Mich., across river from Sarnia, at rate of 8000 bbls. daily.

Cargo of 125,000 bbls. was brought to Marcus Hook in Panamanian Flag tanker "Orville Harden."

Tanker Rates Continue Rise

NEW YORK, Dec. 10.—Coastwise tanker rates continued to advance the past week. "Dirty" rate jumped from 48c for 10-19.9 gravity fuel to 60c on the last fixture reported. "Clean" rates moved up another nickel, reaching 70c for gasoline, 75c for kerosine and 80c for No. 2 fuel.

Two "clean" tankers were reported fixed Dec. 6 from Gulf N-Hatteras, one at 70c, 75c and 80c for gasoline, kerosine and No. 2 fuel, respectively, the other at 67c for No. 2 fuel only, 2 consecutive voyages.

Fixture of the American-Flag tanker "Ulysses" at $8.50 a ton "dirty" from Aruba or Curacao to Buenos Aires for 6 consecutive voyages, was reported. The "Ulysses" was said to be partly owned by Norwegian interests, and is denied coastwise privileges. A foreign-flag tanker, "Suderoy," was fixed for minimum 10 gravity fuel at 25c from Gulf to Havana, Cienfuegos or Neuvitas, according to reports.

ICC Examiner Limits Non-Driver Exemptions

N. P. N. News Bureau

WASHINGTON, Dec. 10.—Loaders and helpers will be the only other employes engaged in oil transportation by truck (in addition to truck drivers) who will be regarded as essential to safety operation and therefore subject to the Interstate Commerce Commission 60-hour week, if the ICC adopts recommendations filed by Examiner R. W. Snow.

Examiner Snow further recommends ICC hold additional proceedings to promulgate rulings to this effect, after finding commission does not have jurisdiction over dispatches, office workers, mechanics, garage employes, and armed guards. Latter employes would continue subject to maximum hours of the wage-hour division requiring payment of time-and-a-half for all hours in excess of 40 per week.

Injunctions Issued In West Coast Case On Reclaimed Lubes

N. P. N. News Bureau

LOS ANGELES, Dec. 6.—Permanent injunctions, by stipulation, were issued this week by the Los Angeles District Court against Golden State Oil and Grease Co. and Jean P. Sarlin, prohibiting misuse of the name "Pennsylvania" in the sale of motor oils.

Injunction provides that the name "Pennsylvania" or any abbreviation thereof may not be used on any motor oil which is not manufactured from 100% Pennsylvania grade crude oil. It also prohibits any implication that a lube oil has Pennsylvania characteristics, unless in fact it is a 100% Pennsylvania grade lube.

In addition, injunction also prohibits the sale of re-run, filtered, reclaimed or redistilled oil unless labeled as such.

Coincident with the settlement of this suit, which was brought by Pennant Oil & Grease Co., similar charges were filed by the Pennant company against Berk Brohm, doing business as Berk Oil Co., together with 40 unnamed individuals and 15 companies, listed as jobbers, reclaimers, drivers and retailers of the Berk company, whose brands were said to include Beverly Penn, Vita Lube, X-Q, headline Sales, Penn Globe, Racer Penn, Everready Penn, Penn Glow, Beaver Penn and Tip Top.

Complaints in both of these suits charged violations of the state petroleum fraud prevention law of 1931 and the California penal code.

Wisconsin Refinery To Be Ready Dec. 15

SHEBOYGAN, Dec. 9.—Wisconsin Oil Refining Co. here will have its new refinery—the first in Wisconsin—ready for operation "about Dec. 15," announced Dewey E. Foster, president, today.

This new plant will have a capacity of 5000 bbls. daily.

Air Crash Kills National's Manville; Paul Ryan Injured, But Is 'Improving'

C. W. Manville

CHICAGO, Dec. 10.—Charles W. Manville, 39, Cleveland, general sales manager of National Refining Co., was killed and Paul Ryan, Cleveland, National's president, was severely injured when the transport plane in which they were riding crashed Dec. 4 near the Chicago Airport.

A late report today to NATIONAL PETROLEUM NEWS from the Holy Cross Hospital said he was "improving and much better." Mr. Ryan suffered a fractured leg and thigh and severe head injuries.

Mr. Manville was well known in the oil business, having had 17 years' oil experience in this field. He is a graduate of Massachusetts Institute of Technology where he received a Bachelor of Science degree in Business and Engineering administration.

This oil man started his career with Standard Oil Co. of Indiana in 1923. In 1929, he moved to St. Louis to work with Shell Oil Co., Inc., as assistant manager of the by-products department. In 1933, he moved to Indianapolis as Shell's division manager and remained there until 1937 at which time he returned to St. Louis as manager of the central division.

He remained in this capacity until March 1, 1940 when he was appointed National's general sales manager.

Mr. Manville leaves his wife, Mrs. Mabel Manville and three children: Richard, 15; Peter, 12; and James 4. Funeral services were held Dec. 7 at Medina, O.

Elder Heads Refineries Of National Refining

CLEVELAND, Dec. 9.—Appointment of Thomas G. Elder, Alton, Ill., as superintendent of manufacturing for National Refining Co., was announced today by Louis S. Peirce, National's secretary. Mr. Elder, who is 40 years old, has been refinery superintendent at Shell Oil Co.'s Wood River, Ill., plant since 1938.

Starting with Shell 22 years ago as a refinery gauger, Mr. Elder became superintendent of Shell's Houston refinery in 1929. In 1937, he became manager of Shell's East Chicago refinery.

Alex McCandless Heads Illinois-Indiana Assn.

ROBINSON, Ill., Dec. 9.—Alex U. McCandless, Robinson, of Mahutska Oil Co., was elected president of the Illinois-Indiana Petroleum Assn. at annual business meeting here.

C. C. Carrol, Marshall, Ill., of Ohio Oil Co. was named 1st vice president, and F. H. Lager, Terre Haute, Ind., The Siosi Co., 2nd vice-president. T. B. Steele, Robinson, Kewanee Oil Co., was elected treasurer, R. B. Kelly, Olney, Ill., The Pure Oil Co., secretary, and Lee Mulvihill, Robinson, was named executive secretary.

In addition 2 members were elected to the executive committee. They are: Frederick Grumme, Indianapolis, Premium-Bolyard Co., and Merle Becker, St. Louis, of the W. C. McBride, Inc.

Other members of the board of directors, besides officers, are:

J. T. Cumbie, Mattoon, Magnolia Petroleum Co., W. S. Corwin, Robinson, Tide Water Associated Oil Co., H. N. Pardee, Tulsa, The Texas Co., W. A. Watkins, Mattoon, The Carter Oil Co., F. B. Barnes, Robinson, Barnes-Craig & Lowrie, William Bell, Robinson, Bell Brothers.

Texas May Cut 50,000 Bbls.

Special to N. P. N.

AUSTIN, Dec. 10.—As Texas oil men began to gather for dramatic emergency hearing Wednesday, Commissioner Ernest Thompson, Tuesday, predicted the commission will slash production from 50,000 to 60,000 bbls. daily.

Thompson said Texas now producing 32,000 bbls. daily in excess of Bureau estimate of states consumer demand, adding that Bureau is "best estimate we have."

Thompson said by expiration date of present 60-day oil order state would be producing around 66,000 bbls. daily over Bureau estimate, due to completion of new wells.

Commission last week declared hearing called in order to re-examine purchasers nominations.

THE EDITOR'S PAGE

Readers Comments and Opinions will be much Appreciated by—WARREN C. PLATT, Editor and Publisher, Penton Building, Cleveland, O.

We Appeal for Relief from Screwy Fractions

This is a plea to streamline a small detail in oil industry accounting that, over the ages, should save the oil industry millions of dollars of figuring time.

This plea is addressed this time, because we have made it before, to the Petroleum Accountants Society of Oklahoma and particularly to its new president N. C. Cross of the Superior Oil Corp. We single this fine society and its excellent president out because the society's members are right in the heart of the territory most afflicted by the evil we seek to have corrected, and also because they are the people who should have much to say about that correction.

We are again moved to make this plea not only for the good of humanity and accountants, bookkeepers, price clerks and all in the sales departments, but also because we are in a wilderness of averaging a lot of funny fractions that run many places to the right of the decimal—all this as we are putting the finishing touches on N.P.N.'s Oil Price Handbook for 1940. We beg relief for all brother figurers in the oil industry but we also urgently solicit relief for ourselves as we make our annual grand onslaught onto hundreds of thousands of price computations with our figuring machines.

All we ask the Society of Accountants to do is to see if they cannot convert this oil industry to use tenths and even hundredths of a cent in figuring tank car prices and to discard the quarters and eighths that lead to such unwieldly fractions.

Why worry mankind, especially in these war days, with fractions such as 0.125, 0.625, and 0.875, and then try to average them out into something handy for a busy oil man to use in his day's work?

Maybe the reader does not recognize these, but they are the decimal expressions for ⅛, ⅝ and ⅞. In their common fraction form they are utterly unmanageable except with electric power driven computing machines and slide rules run by ½ HP. motors. As decimals they are bad enough.

There appears to be no reason for using these funny fractions except that the industry started with pennies and then began splitting them and then splitting their parts. The practice is contrary to the American money system which uses tenths down to mills.

The oil companies have at last come to using tenths pretty generally in their tank wagon and retail prices. However, one finds both systems in the same company.

A year ago, the Shell, when it introduced its posted tank car price and began quoting on a delivered basis in the Middle West, discarded the funny eighths and came to the American decimal system of tenths.

The oil industry, like all America, has some "hard-way-to-do-it" methods, such as the 42 gal. bbl. However, it might now switch to a 100 gal. or even a 1000 gal. unit of measurement and save everyone time and headaches.

Switching to tenths, for tank car prices, would be such an easy thing. All that a company or its sales manager has to do is to quote its next price in tenths. It won't upset anyone's applecart, it won't disturb existing contracts, it won't even get us into this second World War.

We now appeal to the Petroleum Accountants Society of Oklahoma for their earnest consideration of our plea because they are the boys who have to wrestle with these screwy common fractions so many hours out of each 24 that we think our plea should certainly strike a warm spot in their hearts.

Then, if we can stir them into self-defense and to simplify their own day's work, maybe they will go to the sales managers and prevail on them to QUOTE THEIR NEXT PRICE in tenths, the simplified, streamline, American legal way.

Please, President Cross!

Don't Mind the Bloody Shirts

Oil men to whom we have been talking of late—and we mean mostly oil marketers, the men on the sales firing line—are expressing great uneasiness over the prospects of the National Administration trying to load more of either government operating expense or our War Defense expense onto the price of petroleum products.

Adding to the gasoline tax looks easy in any state or in Congress and it produces so vast a sum of money without cost or bother to the government, that the oil man's fears are entirely justified.

They are heightened also by the fact that the New Deal does not like the oil industry and has been doing most everything it can to depict it before the voting public as a lawless and unmanageable industry. In such an atmosphere then, these oil men ask, what chance has the industry for fair and sound consideration of the merits of any objections that might be raised to increasing federal petroleum taxes?

Complicating the problem are the efforts of many people to have the government construct "super" highways for "military purposes." On paper these, so far, generally run from the place where many votes are to the place where many votes may be needed by a brother Congressman, or the Administration in power in the state or at Washington. Surely, the argument will run, those who use and "profit" from these new highways, the passenger car owners and the truck operators, should help pay for them?

The good roads of the country have been built mostly out of the car and truck owners' money. Even these super highways that have been financed with bonds and government loans chiefly come out of the car owner's pocket in the end, because the car owners constitute the most important tax-paying group in the country of both direct and indirect taxes.

It has been very easy for government to spend the car owners' money, especially as car owners are still thought of as constituting the "wealthy class" even though WPA'ers drive to their work and the unfortunates who receive government charity seem to manage a little gasoline money.

It has also been easy for some people, both in and out of government, to propose taxes on fuel oil under the guise of "conservation." When the mask has been finally torn off the faces of these "conservationists," they have been found to bear a marked resemblance to coal operators and to "C.I.O." Lewis' coal miners who were simply trying to put a competitive burden on oil so, with the aid of the New Deal, they could hoist the price of coal. Lewis and these coal people do not care if they do "send mother back into the dirty cellar to shovel coal and ashes" if they can make more money out of her labors.

Undoubtedly, at this next Congressional session there will be more proposals to tax heating oil, especially as our great "Conservationist" Harold Ickes, is now stuck with the task of making his government regulation of coal prices work, and from all reports his efforts are not panning out so well. We can also expect Ickes to push his and Roosevelt's bill to place the entire oil industry under his control as a "conservation" measure.

So the oil industry probably is in for a most difficult time. There will be both good and bad motives behind the various tax and other regulatory proposals that will be made. If the bad motives are attacked, the proponents will most certainly wave their bloody shirts in the name of "patriotism" and "war defense." And if question is raised as to the fairness of the amount of a tax, assuming a good motive behind it, again we will undoubtedly see more bloody shirts flying in the oratorical breeze.

But despite all these possible vexations, the oil marketers we have heard discuss are of the opinion the industry must not hesitate to fight anything and everything it believes is not only against the interest of the car and truck owners, but also against the interests of the oil industry.

These men also believe that the car

owners are paying enough directly now; and that an increase in motor fuel and lubricating oil tax would restrict the use of cars and trucks at a time when their greatest use would be needed for war defense.

How are all these billions of dollars of new and extended munition plants, especially in new territory, going to be manned with workers unless those workers are allowed to use their cars freely?

The government is planning much new housing "near" these plants but what is "near" to an ammunition plant for a worker's wife and kids? One would say a few miles is plenty "near" enough.

But building new homes for all the expected hundreds of thousands of workers AND THEIR FAMILIES at these new plants is such a job that one is entirely justified in anticipating that these homes will not be done in time, if they ever are built. Already the first draft of soldiers is being postponed even until next spring because of government failure to get going in barrack construction on any good schedule.

It would seem clear that as this is going to be a "mechanized" war, or war defense, the cars and buses and trucks that carry and serve the workers at the thousands of manufacturing plants supplying the mechanics of this war, are just as essential to the cause as are the arms and munitions these workers will produce AFTER they have used this gasoline and their cars to get to the plants.

Hence, any increase in taxes on gasoline or lubricating oil will fall directly on these workers and on the country's cost of preparing its defense. It will fall in a most direct and even burdensome manner right where it can be the greatest burden. Another cent a gallon may seem trivial to a Congressman but it must be multiplied by all the gasoline that the workers will use for all of their needs, including the cost of trucking supplies to them, and not just the cost of getting them to and from their work.

Furthermore, any more increases in petroleum taxes will make the job of tax collection enforcement more difficult, a job that the oil industry once had to largely assume. Higher taxes mean more tax evasion and that means more disturbed and unprofitable gasoline markets. While some in Washington refuse to recognize it, the fact is this war defense will have to be paid for out of PROFITS.

It seems clear, therefore, that the oil men owe it to their 30,000,000 and more customers to continue their constructive and "loyal opposition" to all measures that, in their opinion, are against the interests of these customers, both as customers and as citizens and tax payers of this country. They should not be deterred or coerced by the windy wavers of the bloody shirts of alleged "patriotism."

OIL TAX NEWS

TNEC Attacks Gasoline Taxes

N. P. N. News Bureau

WASHINGTON, Dec. 9. — Present system of taxing gasoline is unsound, and existing levies are too high and in need of a substantial downward revision, according to a newly-issued report on taxation by the Temporary National Economic (Monopoly) Committee.

Prepared by Dr. Dewey Anderson, TNEC executive secretary, and entitled "Taxation, Recovery and Defense," the monograph states that:

"The gasoline tax has been unusually popular as it is generally considered to relate closely to the motorists' use of the roads. In many states the proceeds are earmarked for road construction and repair. The relation actually is not close, however.

"The tax takes no account of the relative wear and tear on the highways by different weights of vehicles; it makes no allowance for use by taxpayers of the particular sections of highways for which the tax money might have been spent; it makes no allowance for the relative use or profit derived from the highway by different types of vehicles; and it in no sense measures the benefits from feeder roads to railroads, whose freight-handling speed has been greatly accelerated by highways built at the expense of motorists."

Points to 12c Rate

Pointing out that in certain cities in Alabama the combined gasoline tax levied by city, county, state and federal governments reaches the "staggering total" of 12 cents a gallon, the report lists taxes on gasoline, lubricating oil and crude petroleum as "regressive" in character.

"Regressive taxes" are defined by Dr. Anderson as levies adversely affecting the consumer, and which tend to curtail consumption either directly, or indirectly, as for instance, where the gasoline tax adds to the cost of delivering goods. Although levied on producers, the tax is regarded generally as an unconcealed retail sales tax and is collected as such from the motorists at time of the purchase of gasoline, the TNEC monograph states.

The monograph also declares the most suitable unit of government should collect the tax and allocate a proper share to all other governments concerned, citing the "substantial headway" made in certain states where gasoline and automobile property tax levies are collected by the state and then allocated to counties and cities to meet road costs on some equitable basis related to the volume of gasoline sales and ownership of automobiles.

A further suggestion contained in the monograph which TNEC Chairman O'Mahoney says will "provoke discussion—not to say controversy—" is the levying of very high commodity taxes on automobiles, radios, gasoline, and refrigerators, and so on for the express purpose of curtailing mass luxury consumption. Such a tax, however, is not proposed for the immediate future, but only for such time as a preparedness or war program makes a reduction in civilian consumption necessary.

'Business-Like' Approach to Government Urged at Mi d-Continent's Tax Meeting

N. P. N. News Bureau

TULSA, Dec. 9.—Oil industry tax experts attending the Mid-Continent Oil & Gas Assn.'s tax meeting here last week were challenged to focus their attention on the cost of government —"that which creates and makes taxation necessary."

A more business-like approach to governmental spending and administration of tax proceeds was strongly advocated by Frank B. Long, Tulsa, vice-president of Oklahoma Natural Gas Co. in the opening address of the meeting.

If your oil company finds it essential to spend $1,000,000 for unanticipated vital purposes, and its operating income is only slightly more than $1,000,000, what does the company do? Mr. Long asked. "It curtails the cost of operations at outlying units so the unanticipated bills can be paid," he answered. "Government should follow the same sound business rule."

"You gentlemen here must blaze the trail" in obtaining lower-cost operations in state and other political subdivisions, he contended. Make it your job to see that operating costs are cut, eliminate waste and honestly administer the expenditure of the country's tax money, he urged.

Judge J. C. Hunter, Abilene, Tex., president of Mid-Continent association, urged restrictions on unnecessary governmental spending so tax collections could be concentrated on necessities created by national defense.

Speaking on "Trends in Social Security," George Guth, Washington, Socony Vacuum Oil Co., Inc., stressed the immensity of social security tax payments. "This is your program, you are paying the bill, and you have reason to expect ultimate benefits therefrom. Now from a business standpoint and as assurance that you get value received, what are you doing about it," he challenged.

The depletion allowance, dear

Two years—two Dubbs units

Two years ago Mid-West Refineries, Inc. installed a Dubbscracking unit in its skimming plant at Alma, Michigan to crack 1000 barrels a day of topped crude and reform 200 barrels a day of straight-run gasoline

Gasoline yield, octane rating and sales went up together

Next a U.O.P. catalytic poly unit was installed to make polymer gasoline from the cracked gases Results were still further improved

Right now the company is increasing the capacity of the Dubbs unit to crack 900 barrels more per day, and reform 100 barrels more of straight-run gasoline

Just lately Mid-West bought another refinery at Grandville, Michigan

The first move after taking over the plant was to start putting in a Dubbscracking unit—rated capacity 2000 barrels a day

No wonder

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

to the hearts of all oil men, has a turbulent future, according to Congressman Wesley E. Disney of the Tulsa district. He described previous efforts to reduce or eliminate the allowance and concluded that "we may not be able to save that 27.5% allowance for you."

Federal Control Seen

Tax men were warned that Washington now is talking of "economic zones to replace states" and that such plan would result in civil rights dictated by the central power that brings about such a plan. Federal control is being brought about under the guise of liberalism, he said, labeling modern so-called liberals as "reactionaries" who would take us back to autocracy.

The Kansas revenue system was described by Dr. F. H. Guild of the Kansas Legislative Council's research department.

Reports of standing tax committees and executive discussions of tax problems were prominent features of the 2-day program.

The tax men elected John Hammermann Jr., Houston, Gulf Oil Corp., as new general chairman of the Standing Committee on State and Local Taxation. The Standing Committee on Federal Income and Excise Taxation will be headed by H. F. See, Dallas, Atlantic Refining Co. Fort Worth was chosen as the 1941 convention city.

Oklahoma's Gov. Leon C. Phillips stressed the need for more economical operation of state governments and pledged his support in the move. He was principal speaker at the association's luncheon.

Socony-Vacuum Advances N.Y.C. Gasoline Prices

N. P. N. News Bureau

NEW YORK, Dec. 9.—Effective Dec. 10, Socony-Vacuum Oil Co. Inc. will increase its dealer tank wagon price for Mobilgas (regular) 0.5c per gal. in Manhattan, Brooklyn, Bronx and Queens, and 0.3c per gal. on Staten Island (Richmond), according to a company announcement.

Effective same date, the company's posted commercial tank car and tank wagon prices for Mobilgas will be increased 0.4c per gal. in the 5 boroughs Manhattan, Brooklyn, Bronx, Queens and Richmond), announcement said.

Shell Rescinds Advance In Houston 'Gas' Prices

HOUSTON, Dec. 9.—Shell Oil Co., effective Dec. 7, announced 1c cut in its dealer tank wagon prices in the Houston, Tex., area, to 9c, 7c and 5c per gal., for Ethyl, housebrand and motor, exclusive of taxes. Company had previously advanced prices 1c per gal. earlier in the week.

Kerosine, Fuel in N. Y. C. Advanced by Socony

NEW YORK, Dec. 9.—Socony-Vacuum Oil Co. today announced that, effective Dec. 11, it would advance its prices for kerosine and No. 2 fuel oil 0.2c at New York harbor and surrounding territory, by all methods of delivery. This advance will cover New York City, Long Island, Westchester County and east to Stamford, Conn., according to a company announcement.

Mid-Continent Tax Experts Meet at Tulsa

New and retiring officers of Mid-Continent Oil & Gas Assn.'s tax committees are: (left to right) John Hammermann, Jr., Houston, Gulf Oil Corp., new general chairman of Standing Committee on State and Local Taxation; Dan D. Harley, Fort Worth, The Ohio Oil Co., retiring chairman of that division; J. A. McNeese, Ponca City, Continental Oil Co., retiring general chairman of the Standing Committee on Federal Income and Excise Taxation; and H. F. See, Dallas, Atlantic Refining Co., new general chairman of that committee

Gulf Coast Crudes Reduced By 2 Independent Refiners

(*Continued from page* 13)

gravity, with 1c differential for each degree of gravity to $1.13 for 40 and above.

The following explanation accompanied Republic's announcement of new crude prices:

"The posted field prices of Gulf Coast Crudes, as you are aware, have been fairly constant for a long period of time, however, the Gulf coast prices for refined products have been below normal and much less than actual cost to the Gulf Coast refiner for a long period of time.

"The decline in Gulf Coast prices of refined products has been continuous and the declines during the last year are illustrated by the following prices from PLATT'S OILGRAM as of Nov. 27, 1939, and Nov. 27, 1940:

Gulf Coast Prices

Product	11/27/39	11/27/40
72/74 octane gasoline	6.125c	3.50c
Kerosine	4.50c	3.75c
No. 2 heating oil	4.00c	3.25c
Bunker Fuel oil	$0.95	$0.80

"In the hope that this situation would right itself we have continued the policy of paying higher prices for Gulf Coast crudes than could be realized from the products although this company has been offered Gulf Coast crudes much lower than our posted prices. It is obvious to all that such a policy by a manufacturer cannot be continued indefinitely.

"As you no doubt are aware, East Texas and some West Texas crudes at lower costs are refined on the Gulf Coast in competition with Gulf Coast crudes. Crude oil in the form of recycling plant distillate is being sold F.O.B. Gulf Coast at prices under field posted prices of crude oils (subject to proration orders), plus transportation of such crude, according to what we consider reliable information. East Texas and West Texas crudes are being sold on the Gulf Coast in competition with the higher priced Gulf Coast crude, and East Texas crude in particular has been available at the Gulf Coast at prices considerably under field posted prices, plus published transportation tariffs, which situation also applies to a very few Gulf Coast crudes.

Crude Cuts Regretted

"We regret very much the necessity of reducing our posted field price for Gulf Coast crudes and it is our hope and belief through the attention, consideration and co-operation of all interested parties that the prevailing abnormal conditions will be corrected and that refined products manufactured from Gulf Coast crudes will soon bring prices commensurate with their true value, thus making it possible for this company to increase its posted field price for crude."

Following are Amsco's new crude price postings and the amounts of change:

Saxet: 20-20.9 gravity 93c, with 1c differential for each degree of gravity to $1.01 for 28 and above. Cut of from 1c to 8c a bbl.

Plymouth, East White Point and Taft: Same as posted by Republic.

LaRosa: 20-20.9 gravity 80c, with 1c differential to $1.00 for 40 gravity and above oil. Increase of from 1c to 12c a bbl. on 20 to 31 gravity oils, unchanged on 32-32.9 gravity and a cut of from 1c to 8c on 33 gravity and above crudes.

Texas Calls Hearing After Oil Price Cut

(*Continued from page* 13)

prices being raised on another. Commissioner Ernest O. Thompson pointed out that at the recent statewide proration hearing there was not a single request that crude production be cut, and purchasers' nominations were far in excess of actual production that was allowed by the oil order.

Col. Thompson asked why crude prices should recede when there is not enough production to fill the avowed demand. Commissioners indicated that purchasers' nominations will be taken under oath, and if there is evidence of overproduction running down the price, fields producing the excess may be cut.

Editorial writers for the "Austin Statesmen" saw in the higher gasoline and lower crude prices an attempt by opponents of the present commission's policies among royalty holders and the consuming public to capitalize on the situation and press for a separate oil and gas commission easier. The newspaper expressed fear that such a move might also pave the way for federal control.

S. C. 'Gas' Taxes Up

COLUMBIA, Dec. 6.—Gasoline taxes collected in South Carolina under the 6c per gal. tax amounted to $1,272,958 for November, 1940, officials report, representing an increase of 17 per cent over November, 1939, collections of $1,086,527.

WITH THE ASSOCIATIONS

5% Allowance for Collecting 'Gas' Tax To be Asked by Kansas Oil Men's Assn.

By Telegraph

By N.P.N. Staff Writer

WICHITA, Kans., Dec. 9.—More than 300 Kansas jobbers today pledged support in the Kansas Oil Mens Assn. battle for compensation to marketers for their efforts in collecting the state's gasoline tax.

With the backing of its membership and other interested Kansas jobbers, K.O.M.A. will ask the state to reimburse them to the extent of 5% of the taxes they collect, this to cover additional expenses incurred in acting as collecting agency for the state.

By taking gasoline taxation out of the "Easy to Get" category and placing its collection on a businesslike basis, Kansas jobbers hope they will frustrate attempts to further increase the State's tax rate.

Kansas jobbers were warned at their session today that attempts would be made at the January session of Legislature to increase the gasoline tax, inaugurate a gross production tax on crude, levy a $25 yearly tax on each tank wagon operated in the state and institute further regulations and restrictions on truck operations.

'Down-to-Earth' Talk

In a "down-to-earth" discussion of problems facing jobbers, K.O.M.A. president Fred Kistler, Fred Kistler Oil Co., Coffeyville, warned the group that a departure from the fundamentals of jobbing would not do the job. "We should not fall back on the government—look out for yourself, or the government will look after your business," Mr. Kistler concluded.

During the afternoon, federal wage-hour law officials from Washington and Kansas City were on hand to answer questions about how the wage-hour law is being applied to oil marketing.

In speaking on "Trends of Present Day Marketing," Hoyt Ogrem of Chicago, Kanotex Refining Co., argued for a forceful program that would prevent unwanted politically made laws and guard against "'Ruthless Barbarism and Piracy that destroys and crucifies so many of us." "Mr. Oil Jobber, what is the trend of marketing? that is for you to decide," he concluded.

A Public Relations Program for the Jobber was advocated by C. E. Holmes, association secretary.

New Association Planned By Louisiana Jobbers

NEW ORLEANS, Dec. 9.—A state-wide meeting of Louisiana oil jobbers will be held Dec. 19 at the Heidelberg Hotel in Baton Rouge, R. E. Elliott, president of New Orleans Petroleum Corp., announces.

Purpose of this meeting is to form a jobber's organization to be known as the "Louisiana Petroleum Jobbers' Assn." Invitations to attend the Dec. 19 meeting are being forwarded to every petroleum jobber in Louisiana, requesting either his or his representative's attendance.

Oil Industry Problems Discussed by I.P.A.A.

N. P. N. News Bureau

TULSA, Dec. 7.—Oklahoma members of the Independent Petroleum Assn. of America aired their problems at a luncheon here this week and discussed solutions to problems of imports, conservation, strengthening the Interstate Oil Compact, Federal control and taxation.

Frank Buttram, Oklahoma City, I. P. A. A. president, made a plea for a concerted drive against introduction of the Administration's Oil Control bill and other legislation unfavorable to the industry.

"The extension of the services rendered by the Interstate Oil Compact Commission is not something to be handed down to us by a governmental agency," I. P. A. A. president declared, "although it may require the approval of Congress to become operative, it is rather something to be developed by the industry through the various states which are signatory to the compact."

Station Operators Puzzle Santa Claus Some Open, Some Closed Christmas Day

N. P. N. News Bureau

CLEVELAND, Dec. 10.—It's about time Santa Claus turned in those prancing reindeer and bought a "gas" buggy. At any rate, this seems to be the opinion of service station operators in this nation, most of whom will be ready for Santa's business or anybody else's on Christmas Day.

However, there are a few dealers from "the old school" who still believe that Santa should drive reindeer, stick to oats and not bother them for "5 gals." on Christmas Day. One such group is the Cleveland Assn. of Petroleum Dealers which has plastered signs in station windows reading "This station will be closed all day Christmas".

But if S. Claus does ride in a Detroit motor-puller this year, he can "gas up" at service stations in Brooklyn and Queens, N. Y., for as one dealer expressed it to NATIONAL PETROLEUM NEWS, "competition is too keen" for closing on Christmas Day.

Chicago dealers are undecided whether or not to look for Santa in reindeer or motor car; consequently most of them will remain open a portion of the day just in case the man with whiskers or any of his motoring children put in an appearance.

In Los Angeles, where Santa Claus is just another gigolo who basks in the sun and flirts with Hollywood actresses, most of the station operators will be open portions of the day.

Many of the Washington, D. C., operators will be open, on the look-out, at various times of the day, for some of the New Deal money being shoved around.

Generally speaking, stations in cities will be closed either all or a portion of Christmas Day, while highway stations will remain open all day.

GCRA 'Gas' Stocks Drop 786,387 Bbls.

HOUSTON, Dec. 10.—Gasoline stocks held by the Gulf Coast Refiners Assn. membership Dec. 1 were 786,387 bbls. below Nov. 15 inventories, according to report of G. C. R. A. Aviation gasoline stocks declined 530,651 bbls. during the two week period; motor fuel, 277,724 bbls.

Crude runs at reporting plants were up slightly during the last half of November, standing at 66.5% of rated capacity. G. C. R. A. report had this to say about refinery operations on the Gulf Coast:

"During the past several months non-integrated refiners have been operating their plants at 65% of capacity, and occasionally at even lower rates. This condition has prevailed in the face of operations by larger integrated refining companies operating in this same refining district at rates above 90% of potential capacity. It is a recognized fact in the oil refining business that operations at above 90% rated capacity virtually constitute operations at maximum capacity. Likewise it is recognized that refinery operations as low as 65% of rated capacity represents, for the most part, an uneconomic condition under which refining companies can not long continue in business.

"Currently published statistics dealing with gas oils and distillates and with residual fuel oils report that stocks of the lighter fuels on the Gulf Coast total about 8,702,000 bbls. and stocks of the heavier residual fuels in the area total 8,465,000 bbls. which indicates the non-integrated refineries on the Texas Gulf Coast are holding only a very small percentage of the stocks of these products in comparison with totals for the Gulf Coast," it was said.

Oil Compact Gets a Shot in Arm

N. P. N. News Bureau

TULSA, Dec. 7.—A revitalized but unchanged Interstate Oil Compact will be submitted to the U. S. Congress and legislatures of the nation's oil producing states for renewal and ratification next year. This decision was made here this week by a meeting of Compact members.

Criticisms that the Compact Commission was not getting its job done were answered by the commission with a pledge that the compact would be strengthened—not by wide-spread revision or amendment—but by achieving the full intent and purposes written into the original act. After open hearings and conferences on the matter, the compact's committee on re-drafting the pact presented its conclusions that broad enough powers exist in the present compact and suggested that it be presented for ratification in its present form. Unanimous approval of the recommendation was voiced by the commissioners.

In presenting the committee's recommendations though, Judge J. C. Hunter, Texas' representative, warned against usurping the police powers of sovereign states, but pledged the accomplishment of purposes outlined in the present pact between now and Sept. 1 next year, when it comes up for renewal.

Evidencing the desire to fulfill its pledge of achievement, the compact instructed its legal committee to push its work on a "model" conservation law so a complete and perfected draft could be presented the membership at a special meeting in Oklahoma City Dec. 30.

Since the success and longevity of the compact is to some extent dependent on the status and uniformity of the proration statutes of compacting states, it is believed in some quarters a compact-approved conservation law would undoubtedly be submitted to several state legislatures for consideration at their January sessions.

Several working drafts of a "model" conservation law have been worked out by individual members of the legal committee for consideration. And while the "model" legislation is far from complete, members of the committee indicated it will probably be patterned after the Louisiana and Arkansas proration statutes. The conservation laws of the 2 states, labeled by the committee as "basic," were in turn patterned after the better provisions contained in the laws of other oil states.

Hampered by lack of sufficient staff backed by financial appropriations, the compact has instructed its chairman to appoint a committee to check into this matter. A report at the year-end special meeting is expected. At that time, a budget and financing plan may be presented covering an enlarged scope of activities.

Phillips Re-Appointed

Governor Phillips of Oklahoma was re-appointed to head activities of the compact during the coming year when it is expected the pact will launch its new program. Kansas Corporation Commissioner Andrew F. Schoeppel and P. J. Hoffmaster, Michigan representative, were re-elected first and second vice-chairmen, respectively.

In his acceptance speech, Chairman Phillips indicated his willingness to serve for another year—no more. He assured the membership he had no designs on a third term and that he could handle his job as Oklahoma governor along with the compact chairmanship.

Arkansas, which has been on the "almost persuaded" list of prospective compact members, will consider provisions for joining at its next legislative hearing. Newly-elected Gov. H. M. Adkins of Arkansas and his representative J. H. Alphin were present, together with O. C. Baily of the Arkansas Oil & Gas Commission.

Ewing T. Kerr, former Oklahoman and Wyoming's observer at the compact, reported he found "nothing in the compact that would be objectionable to Wyoming."

Illinois is tired of being Peck's bad boy and is ready to look into the advantages of conservation, according to E. J. Coyle, representing Illinois' Governor Stelle. "We felt we had to go out and make a market for Illinois crude, we've done that and within the past 8 or 10 months sentiment seems to be more favorable toward conservation in Illinois," he said. Gilbert E. Kiebler, observer for Illinois' Governor-Elect Green, was also present.

"There will be no call to complain regarding the co-operation from Texas after Jan. 1," according to newly-elected Texas Railroad Commissioner Olin Culberson. He suggested to "some oil men that they quit soiling their own linen and bringing it to the Texas commission for washing."

Independent Petroleum Assn. of America, which has criticized the commission for not doing full justice to its job, pledged its active support in the pact's revitalization program, re-submitting its suggestions made in annual session at Dallas earlier this year.

A virtual junking of present methods of allocating total market demand to states and to fields was suggested by Joseph E. Pogue of the Commission's advisory committee on economics.

Pogue Summarizes

Summarizing his suggestions on the principles of allocation in oil conservation, Dr. Pogue suggested that state allowables should be broken down into regional quotas to serve as the basis for a computing field allowables. Field allowables

Federal and State Oil Officials Attend Compact Meeting

Shown are members of the Interstate Oil Compact Commission, representatives of state regulatory bodies and other notables in attendance at the compact's annual meeting at Tulsa, Dec. 6-7. Seated, left to right are: Oklahoma Corporation Commissioner Reford Bond; Ewing T. Kerr, Wyoming's attorney general; Judge J. C. Hunter, Texas' representative on the compact; Kansas Corporation Commissioner Andrew F. Schoeppel, Kansas' representative and vice chairman; Oklahoma's Governor Leon C. Phillips, compact chairman; Hiram M. Dow, New Mexico representative; Warwick M. Downing, Colorado representative; P. J. Hoffmaster, representative from Michigan and Gilbert E. Kiebler, representing Illinois' Governor-Elect Green. Standing, left to right are: Samuel B. Pettengill, former member of Congress and the Cole oil investigating committee; Congressman Wesley E. Disney of Tulsa district; Olin Culberson, new Texas railroad commissioner; Major B. A. Hardey, director of Louisiana Conservation Department; Col. W. H. McFaddin, associate compact members from Colorado and Michigan; James Graves, associate representative from New Mexico; Roy Rogers, newly-elected New Mexico land commissioner; A. Andreas, New Mexico state geologist and George W. Holland, director of the Interior Department's petroleum conservation division

should be derived from regional allowables and established on a basis for computing field allocommon ratio to optimum rates.

It was also Dr. Pogue's opinion that the Interstate Oil Compact Commission can play an important part in co-ordinating the work essential to an improvement of the allocation system.

Samuel B. Pettingill, former U. S. Congressman and member of the Cole Oil sub-committee, warned the compact that centralization of power in Washington would spread the quota theory now used in the oil industry to a quota system as between related industries and their products. It would be a matter of quotas handed out by someone in Washington as between oil, gas, coal and other competitive products, he warned.

The Independent Petroleum Assn. of America's Committee on Balance-Demand suggested crude production of 3,400,000 bbls. daily during the first quarter of 1941. Of this total, producing centers east of California were given a suggested allowable of 2,850,000 bbls. daily.

In the closing moments of the compact meeting, Russell B. Brown, Washington, counsel for I.P.A.A. suggested that the compact and state regulatory bodies do such an excellent and thorough job of conservation that anything proposed by Washington would of necessity have to supplant rather than supplement their activities. This suggestion met with considerable response.

Kansas May Get 'Hot' Oil Office

TULSA—Lobby reports at pre-meeting of Interstate Oil Compact Commission indicate recommendations will be made to Interior Department by member of the Department's Petroleum Conservation Division for an office in Kansas to supervise enforcement of the Connally "Hot" Oil Law.

Eastern Markets Threatened By West-East Rail Rate Cut

(*Continued from page* 13)
tion of the new rate schedule will not go unchallenged. At least 3 major companies, Shell, Pure Oil, and Cities Service, expect to file with the Interstate Commerce Commission an application for investigation and suspension of the rates (See later story on p. 13).

ICC Practice Cited

It has been the practice of the commission to suspend rates for about 6 months during period of investigation, when hearings are held. It is believed that a suspension of such a duration would result in the rates being withdrawn because the need for them would not exist during the summer.

The commission could, however, order a shorter suspension period, or despite the protests, order the rates into effect.

The proposal to re-open a movement of petroleum products from Middle West to the East, long dormant, has created widespread interest in petroleum marketing, and some view it as an opening wedge in the re-shuffling, and creating of a new order in eastern marketing.

Requests for similar reductions in rates on gasoline may follow in wake of fuel oil rate cuts.

Rail and Tanker Rates Told

If the lower rates are ordered into effect, railroads stand a chance to regain during the winter a part of the long-haul lost more than 15 years ago. They would be stepping into the picture with rates that are competitive with last winter's and current tanker rates. In January, 1940, rates jumped to 73c per bbl. But current rates for No. 2 of 80c per bbl. have established new highs.

Following is a comparison of new and old rates from Chicago to New York, and last-paid tanker rates from the Gulf:

Rail Rates

	Present Rates		Proposed Rates	
	Per Cwt.	Per Bbl.	Per Cwt.	Per Bbl.
Chicago to:				
New York	40c	$1.243	25c	77.7c
Philadelphia	42	1.305	24	74.6
Baltimore	40	1.243	23	71.4

Tanker Rates

	No. 2 Fuel Last Paid Per Bbl.	Heavy Crude or Fuel Oil Last Paid Per Bbl.
Gulf to:		
New York, Philadelphia, Baltimore	80c	60c

Rails cannot hope, with the new proposal, to regain much crude tonnage, according to oil traffic men. Rates proposed are still considerably higher for crude than the current pipeline rate from Illinois to the seaboard. The cost of piping crude from Illinois, based on tariffs of this summer, is about 40c per bbl., compared with a minimum proposed rail rate of 71.4c per bbl.

Gulf Pipes Crude East

Gulf Oil Corp. has recently completed arrangements (see p. 26) to bring Mid-Continent crude from Oklahoma to Philadelphia via common-carrier pipelines for 57c per bbl.—lower than the base tanker rate, or the west-to-east rail rate.

Proposed rates, if made effective as scheduled on Dec. 20, are expected to affect fuel oil shipments during the peak of the season, when, as has been the case the past 3 years, tanker rates jump as demand is

8% Gain in 1941 Predicted For Refined Oil Products

N. P. N. News Bureau

TULSA, Dec. 6.—Demand for the products from U. S. refineries will increase as much as 8 or 9% in 1941 over 1940 demand levels, according to forecast given the Interstate Oil Compact Commission by A. G. White of the Bureau of Mines.

This increased demand for petroleum products may get off to a comparatively slow start the first quarter of 1941, but the Bureau economist predicted second-quarter demands on refineries for petroleum products would begin reflecting increased industrial and national defense activities.

While optimistic as to demand levels for petroleum products in 1941, White cautioned against excessive crude production the first quarter of 1941. Crude output at this year's level would supply a 45,000,000-bbl. increase in demand during 1941, he said. "Wait until we have definite assurance more production is necessary, before production is hiked."

Sees 1% Demand Increase

The economist's estimate of a 1% increase in demand for crude next year over 1940 brought puzzled expressions to the faces of many compact members.

"Why, in the light of an 8 or a 9% increase in products demand, should we predict such a slight increase in crude demand?" he questioned. "Because there are outside factors to be considered," he answered. A 1% drop in 1941 exports, a 1% increase in 1941 imports of foreign oil, a 1% allowance to overcome present excessive stocks and a 3% allowance for excessive production in 1940 leaves us only 1% of the original 7% increase in crude demand, he said.

Definite pressure from foreign oil left "homeless" by shifts resulting from the European war, will be experienced in the U. S., according to the Bureau's economist. Possibility exists that if these foreign oils are refused admittance into the U. S., they may displace a part of this country's foreign markets.

Residuel Fuel Supply

The critical supply question facing U. S. refiners in 1941 will center around residual fuels, according to White. He suggested 2 alternatives that might be followed in supplying residual fuel demand, due for sharp increases in 1941. We may make a place for part of this foreign oil in the U. S. by substituting this oil with its high yield of heavy fuels for our own high gasoline content crude, he suggested, or, failing of this, may increase runs of domestic oils with resultant increase in gasoline stocks.

Pursuing this line of thought, the Bureau's economist suggested refinery runs average about 3,550,000 bbls. daily during the first quarter of 1941, with possible sharp increases the remaining quarters of the year if justified. Reductions below the 3,550,000-bbl. mark would necessitate increased importations of crude to supply residual fuel demand, while increases above that figure would result in increased gasoline stocks, he warned. Sharp increases in runs, to possibly 3,700,000 bbls. daily the last 9 months of 1941, were predicted

Defense Activities Minimized

Increased consumption and demand resulting from national defense activities will not be reflected much in first-quarter gasoline demand, the economist said in estimating a 5 to 6% hike in motor fuel demand the beginning months of 1941. Distillate fuel and residual fuel demand the first quarter of next year will probably rise 5 or 6% above 1940, it was estimated. An increase in residual fuel demand to levels 10% above 1940 is expected some time during the remaining 9 months of next year.

While a 3,000,000-bbl. pile of aviation gasoline is indicated for government use, actual purchases so far have been small, White reported. He did hint that by March 31, 1941, aviation stocks in the U. S. may reach a mark 3,000,000 bbls. above the same period last year. This new demand brought about by governmental purchases of aviation-type fuel should be given due consideration in analyzing the overall gasoline stock position, he said.

heavy for boats to bring oil from the Gulf.

During the late summer and early fall, when eastern marketers are loading their storage, rail shipments from the Middle West would face low tanker rates from the Gulf and would have to compete with low-cost barge movement from Michigan and Ohio refining centers.

Toledo-Buffalo Barging at 12c

One marketer moved oil from Toledo to Buffalo at around 12c per bbl. and for around 20c from Bay City, Mich., during the late summer and fall. The new through rail rates from the Middle West to the East propose a minimum of 71.4c which would also apply to points intermediate which are now on a higher rate schedule.

'Dislocation' Feared

Most probable effect seen on petroleum marketing is the "dislocation"—as it is called by rate men—that will be caused by the failure of rails to seek Fourth Section relief, resulting in rates to intermediate points that are higher than the proposed schedule for the entire distance, dropping to the latter schedule. (The Fourth Section of the Interstate Commerce Act prohibits the charging of a higher rate for a shorter haul over the same route in the same direction.)

Had the rails asked for exemption from compliance with Fourth Section provisions, then the through rate to the East Coast would have been lower than to many intermediate points. Inasmuch as rails did *not* ask Fourth Section relief, the reduced through rates also apply to intermediate points (for examples see tabulation below).

Sample Intermediate Rates

Following is a list of some of the larger fuel consuming points in the intermediate territory, with comparison of existing and proposed rates per bbl.:

	From Chicago Group Origins		From St. Louis Group Origins	
	Present	Proposed	Present	Proposed
Cincinnati	$0.777	$0.714	$0.808	$0.777
Cleveland	0.808	0.714	1.02	0.777
Lorain, O.	0.777	0.714	0.994	0.777
Massillon, O.	0.839	0.714	1.02	0.777
Sharon, Pa.	0.87	0.714	1.05	0.777
Youngstown	0.87	0.714	1.05	0.777
Pittsburgh	0.932	0.714	1.12	0.777
Buffalo	0.963	0.714	1.18	0.777
Rochester	1.05	0.777	1.24	0.87

May Ask Proportional Cut

In-between areas, like Indiana, Ohio and Pennsylvania, would be still further affected if intermediate rates were reduced proportionately—that is, reduced by 42% as were the through rates to East Coast.

Under present proposal, the reduced through rates also apply to intermedate points (because rails did not ask for Fourth Section relief). This means a reduction below present rates for many intermediate points, but the reduction doesn't amount to a full 42% as on the through rates.

On this point, Shell said in its suspension petition:

"Certainly, there is nothing reasonable, just or right in connection with rate adjustments such as here proposed which would require shippers and receivers, for example, to pay the St. Louis-Baltimore rate—distance of 929 miles—on a shipment from St. Louis to South Bend, Ind., distance of 325 miles."

So, it is expected that companies in intermediate territory would seek proportional rates, if the proposed rate schedule stands. Then, shippers on the eastern seaboard would probably rate reductions to make them competitive with movement from the Mid-West.

Rails Comment on 4th Section

Answering a charge from the oil company traffic manager that if rails desired only to reach the Atlantic seaboard, they could have petitioned for Fourth Section relief, and maintained present rate structures in intermediate territory, the vice president of one of the larger roads replied:

"The reason that Fourth Section relief was not attempted was that the railroads were of the opinion that such an application could not be justified because of the lack of actual water or other competition between the points involved, and a denial by the Interstate Commerce Commission appeared certain. The only result of such an application apparently would be to delay the effectiveness of the rates while the commission considered it, probably resulting in the winter being over and the movement lost before they became effective."

This reply which comes from one of the principal proponents of the proposed new rates leaves no doubt that rails intend to push their application before the commission.

Virginia Gasoline Collections Rise 18% for October

RICHMOND, Dec. 6. — Virginia's gasoline tax collections for the month of October, 1940, showed an increase of 18.9% over the same month in 1939, reports E. A. Kyhn, secretary of Virginia Petroleum Industries Committee.

Gasoline tax collections for October were $1,935,588.35, compared with $1,627,101.25 for the same month in 1939. Collections for the first 10 months of this year were $17,223,871, compared with $15,929,398 for the same perod in 1939, an increase of 8 per cent, report said.

Three Majors Petition ICC To Suspend West-East Rates

N. P. N. News Bureau

WASHINGTON, Dec. 10.—Petroleum shippers waited until the last day—today—to file protest against the proposed cut of about 42% in Middle West to East Coast rail rates on crude and fuel oil.

A check with the Interstate Commerce Commission today disclosed that 3 major companies, Shell Oil Co., Pure Oil Co., and Cities Service Oil Co., have asked for suspension of the rates.

National Coal Assn. also has protested and other oil companies may have filed, although they have not been announced by the Commission.

Protestants to the ICC appear to have relied heavily on the contention that the proposed rates are in violation of Section 3 of the Interstate Commerce Act, prohibiting preferential and prejudicial rates.

In a lengthy complaint Shell charged that rates in the tariff, if permitted to become effective, would discard present mileage bases, and "create serious, extensive and unlawful discriminations and will result in most serious disturbances of rate structures."

Would Violate ICC Act

The proposal establishes rate structures which "would result in violation of Sections 1, 2, 3, and 4 of the Interstate Commerce Act," Shell asserts.

Citing the investigation in 1925 under authorization of the Hoch-Smith resolution (ICC Docket 17,000, Part 4 and 4A), Shell points out that the basis of rates prescribed had the effect of giving rates for each origin and each destination on the basis of mileage. This basis would be discarded in the new proposal, petition states, showing the following table:

Rates in cents per hundredweight from St. Louis-East St. Louis District Roxana Wood River to:

	Miles	Present Rate	Reduced Rate
Baltimore	929	44	25
Philadelphia	968	46	26
New York	1,059	48	28
South Bend, Ind.	325	26	28
Ft. Wayne, Ind.	340	26	28
Richmond, Ind.	309	25	28

Rates in cents per hundredweight, from Chicago to:

	Miles	Present Rate	Reduced Rate
Baltimore	782	40	23
Philadelphia	817	42	24
New York	909	43	25
Detroit, Mich.	267	24	25
Bucyrus, O.	268	24	25
Springfield, O.	267	24	25
Cincinnati, O.	283	25	25

"From the foregoing it will be noted that the St. Louis-Baltimore rates, for example, would blanket back as far West as South Bend, Fort Wayne and Richmond, Ind. and that the Chicago and Baltimore rate would blanket back as far West as Detroit, Mich., Bucyrus, Springfield and Cincinnati, Ohio.

"Certainly there is nothing reasonable, just or right in connection with rate adjustments such as here proposed which would require shippers and receivers, for example to pay the St. Louis-Baltimore rate distance of 929 miles, on a shipment from St. Louis to South Bend, Ind. distance of 325 miles" Shell's petition states.

Urges Hearing

"Certainly it is only fair and right that before the commission accepts tariffs which have the effect of tearing down the adjustment, that it is only proper that the commission at least hold one hearing and thereby afford all interested parties an opportunity to be heard before permitting the rates here proposed to become effective on the date above indicated."

Petition also pointed out to ICC that the hearing held Oct. 29 at the Trunk Line Assn. offices in New York was well attended by shippers of petroleum products in the states of Illinois, Indiana, Kentucky, Michigan, New York, Ohio and Pennsylvania, also by representatives of the Anthracite Institute and other coal interests, "all of whom vigorously opposed the adjustment."

"In fact," petition added, "the opposition was unanimous and there was nobody present at the public hearing in support of the proposition."

In its protest, Pure Oil Co. asserted proposed Mid-West-Atlantic seaboard rates are in violation of the Interstate Commerce Act because they give undue preference to shippers at East St. Louis and Chicago over those located at nearer points of origin.

Pure urged that in event of unusual demand requiring reduced rates from the Mid-West, ICC should give shippers at closer origin points comparable rates, in accordance with the historical petroleum rates of long standing.

Oil Burner Shipments Up

N. P. N. News Bureau

WASHINGTON, Dec. 10. — Shipments of oil burners totaled 40,580 in October as compared with 34,658 October, 1939, and 21,059 in October, 1938, Census Bureau reports. Figures covered 170 manufacturers in 1940, and 178 manufacturers in 1939 and 1938.

Refining Technology

INCLUDING INTERNATIONAL PETROLEUM TECHNOLOGY

LUBRICATION PROBLEMS Further evidence that advances in lubrication are not entirely dependent upon petroleum research chemists and lubricant engineers was given last week at the annual meeting of the American Society of Mechanical Engineers when the results of work at Massachusetts Institute of Technology, financed by the Chrysler Corp., verified claims made by the automobile firm for its "Superfinish".

The load capacity of a journal bearing was found to increase with increase of bearing surface smoothness under conditions of flooded lubrication. A more extensive report of this work is given in the following pages. Since the results do not agree with statements of M. O. Teeter at the annual meeting of the Society of Automotive Engineers last June, nor with results presented by O. R. Schurig last June at a Conference on Friction and Surface Finish, the opportunity is open for clearing up a controversy.

The four M.I.T. men expressed the opinion in their paper that since Teetor's work was with two cast iron surfaces rubbed against each other with a reciprocating motion where lubricating conditions were believed to be poor, the two conclusions might be reconciled. Schurig's work was similar to Teetor's as far as hard mating surfaces of the same material is concerned, but a fine-ground against a sandblasted surface had triple the load-carrying capacity of fine-ground against fine-ground surfaces in the Almen test machine. At least one conclusion can be drawn from this apparent disagreement of results. This is that improvement of bearing surface finish is not always true in raising bearing load capacity. Nor has it eliminated the necessity for making mating bearing surfaces of different materials.

Another problem which has closer bearing on the manufacture of lubricating oils subjected to extreme pressures is being attacked by a special committee of the A.S.M.E. and a progress report was given at the annual meeting. This has to do with the apparent solidification of certain lubricating oils under high pressure. It appears that naphthene-base mineral oils have not been solidified by pressure but mineral oils containing sufficient paraffin wax and compounded oils have been reported solidified.

At present the study of this phenomenon is far from completed. However, the work has gone far enough to show flow and shear characteristics of one mineral oil and a scheme of interpretation of the curves has been developed. Since the relationship between the shear stress and rate of shear is one of the most important characteristics of a lubricating material at ordinary pressures and temperatures, any variation of this relationship resulting from conditions likely to be found in utilization of lubricating materials bears close watching.

REFINING CENSUS The number of petroleum refineries in the United States increased from 365 in 1937 to 485 in 1939, according to a preliminary report on the 1939 Census of Manufactures just made public. This apparent gain of 32.9% is open to question in view of annual Bureau of Mines reports as of the first of each year. The Bureau of the Census is unable to give definite reasons except that the 1939 census was a field canvass while the 1937 census was a mail canvass. It is considered possible that men in the field located many additional refineries whose names did not appear on census records for the 1937 canvass. The 1939 census figure, while not in exact agreement with the Bureau of Mines figure, as would be expected in consideration of the different dates of the reports, is now in much better agreement than it has been since 1933.

Although such a reported gain, involving the small refineries, is doubtful, it appears to have little effect upon other data. Thus, with over 100 more refineries reported, salaried personnel and wage earners are shown to have decreased 3.4% and 12.4% respectively in the two-year period.

The census report for petroleum refining deals largely with changes in production and value of refined products. A large increase in production of products was accompanied by a decline of $85,000,000 in their total value. The 1939 valuation of all petroleum products from refineries is given as $2,461,000,000 of which $528,000,000 was added by manufacture. This latter value is shown to have increased by $46,000,000 between 1937 and 1939.

The gain in gasoline production was 1,667,000,000 gallons in the two-year interval yet total valuation dropped $23,000,000. These figures are more easily comprehended when interpreted in cents per gallon. The 1937 valuation indicates an average value of 6.39 cents per gallon while that for 1939 is 5.84 cents. The decline in value is 8.6% as compared with a production gain of 7.35%.

Similar figures are found for fuel oils and lubricating oil, both of which showed gains in volume of production and declines in total valuation. For fuel oil the indicated valuation per gallon dropped 0.30 cent per gallon, representing a loss of 11.3% in value while lubricating oil value dropped from an average of 16.20 to 14.77 cents per gallon, a reduction of 8.8% in value.

There are many factors that affect the market valuation of petroleum products but the history of refining development and the continued decline in refinery prices year after year, are undeniable evidence that the technologic improvements of oil refining have certainly been passed on in lower prices to the consumer. Many a time price declines have followed so closely after the industry's general installation of some particularly new and revolutionary type of equipment, that the refiners have wondered what was the use in spending all that money. But the improvement goes on as this census report shows.

Lubrication Problems Absorb A.S.M.E. at Annual Meeting

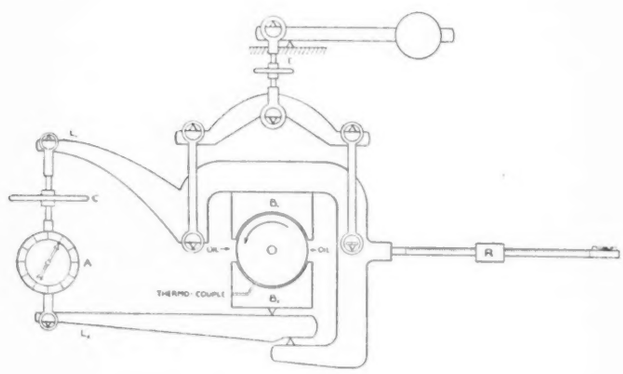
ABSTRACT

Increase in the load capacity of a bearing with increasing smoothness of bearing surface emphasizes the importance of a high surface finish, bearing tests at Massachusetts Institute of Technology show. Preliminary study of the rate-of-shear versus shear-stress relationship of oils undergoing apparent solidification at high pressure shows oil consistency is dependent upon time of pressure application as well as temperature and pressure. Used turbine oil added to new oil inhibits rust, General Electric engineer finds. "Best oxidation test" is described. Eastman Kodak lubrication engineer finds new problems in use of additive oils.

Aluminum brass recommended in condenser service. Proper manufacturing procedure is found an important factor in making corrosion-resistant tubes.

NEW YORK, Dec. 6.—The surface finish of steel shafts has little effect on the operation of a journal bearing in the region of hydrodynamic lubrication but does affect markedly the load capacity of the bearing, it was brought out at the annual meeting of the American Society of Mechanical Engineers closing here today, as the result of studies conducted in the lubrication laboratory of Massachusetts Institute of Technology. Surface finishes having roughnesses ranging from 130 to 1 micro-inch, as measured by their root-mean-square deviations from a median plane, were tested. These conclusions were reached by J. T. Burwell, J. Kaye, D. W. van Nymegen, and D. A. Morgan, authors of the paper presented.

Results of their work indicates an increase in the load capacity of a bearing with increasing smoothness and emphasizes the great importance of reducing the surface roughness to less than 15 micro-inches at least. It was pointed out that these conclusions do not agree with statements of M. O. Teeter at the June, 1940, meeting of the Society of Automotive Engineers, who found that the smoother the surface was the less the load capacity, but that since his experimental conditions were different there is a possibility of the two conclusions being reconciled.



Friction testing apparatus used at M.I.T. for determining the effects of surface finish

"The performance of journal bearings when operating under light loads and high speeds can be accurately described by hydrodynamical theory where the only physical properties of the system that are of importance are its geometrical dimensions and the viscosity of the lubricant," it was pointed out. "At higher loads and lower speeds, however, this simple theory is insufficient and, while a complete theory is lacking, it has been found empirically that many other physical properties of the system affect the behavior of lubricated journal bearings.

"These properties are of two general kinds, those of the lubricant and those of the bearing surfaces. In the first class are the heat capacity of the oil, its pressure and temperature coefficients of viscosity, its adsorptive ability, and its corrosion products with the metal surfaces, all of which are commonly lumped together in the ambiguous term 'oiliness'. In the second class are such properties as the thermal expansions of the two metals composing the bearing surfaces, their thermal conductivity, their elastic and plastic properties, and their surface smoothness."

The friction testing apparatus consisted essentially of a test shaft running between two identical split bearings against which variable pressure could be exerted. Flooded lubrication was employed. The bearings were a tin-base babbitt with steel backing. Test shafts were of S.A.E. 1040 steel with 200 Brinell hardness.

Run-in Process Studied

As a part of the program on the study of the effects of surface finish it was decided to find what effect surface roughness has on the running-in process. It was thought that one of the most significant quantities to measure would be the metal actually removed from the surface as the operation of the journal bearing progressed. A sensitive method of determining iron in oil was developed, involving the extraction of the iron from the oil by means of hydrochloric acid. This permitted the determination of 1 part of iron in 10,000,000 parts of oil.

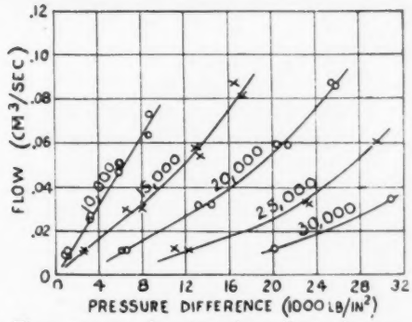
"The effect of pressure on the running-in process was studied while maintaining a constant surface finish. The results indicated that the wear at the end of 2 hours increases with pressure for the pressure range up to 1000 psi. and the conditions obtaining in these studies.

"The effect of surface finish on the running-in process was measured at constant pressure. A remarkable straight-line relationship exists between the total wear at the end of 2 hours and the degree of surface finish. It was found that the running-in period takes place in a short time, of the order of one-half to one hour. The initial rate of wear is high and falls off rapidly. In all cases the quantity of metal removed was quite small, being less than a millionth of an inch if it could be considered as being removed uniformly.

Apparent Solidification of Lubes Investigated

Results of a preliminary study of the rate-of-shear versus shear-stress relationship for several oils known to undergo apparent solidification when subjected to high pressure, were presented in a paper by A. E. Norton, late of Harvard University, M. J. Knott, Brown & Sharpe Mfg. Co., and J. R. Muenger, Harvard University. The tests included one mineral oil, lard, rapeseed, and sperm oils. The temperature range of tests was 41-78° F. and pressures up to 50,000 psi. were applied.

The phenomenon cautiously termed "apparent solidifi-

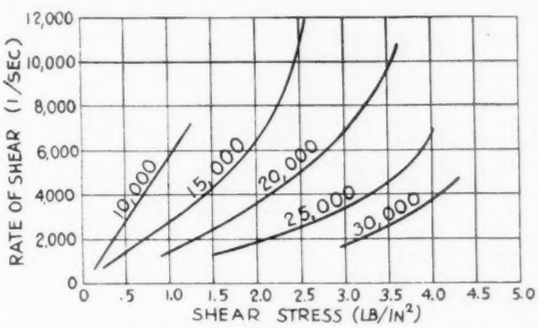


Flow curves showing the effect of pressure on flow of Veedol medium (S.A.E. 30) at 20° F. Pressures are indicated in psi

cation" has been checked by several experimenters but the first quantitative measurements were made by the authors. "It appears that castor oil and naphthene-base mineral oils have not been solidified by pressure, and that the only lubricating oils for which pressure solidification has been reported are lard, horse, rapeseed, whale, mineral oils containing sufficient paraffin wax, and compounded oils.

The purpose of the project, which is being conducted by a lubrication committee of the A.S.M.E., is to investigate the properties of certain lubricants at or near the condition of apparent solidification, due to physical conditions. An attempt has been made to determine the characteristics of these lubricating oils which are normally liquid but which may become stiffer due to high pressure or low temperature singly or in combination.

The authors concluded that the problem has by no means been solved. In summarizing they state that "the consistency of an oil near apparent solidification is dependent upon time of application of pressure as well as upon the amount of pressure and the temperature. The consistency is very likely dependent upon the amount of shear as well."



Shear characteristics of partially worked Veedol medium at 20° F.

Used Oil Inhibits Rust

Discussing the "Lubrication of General Electric Steam Turbines," C. Dantsizen brought up the controversial question as to whether a high-viscosity-index oil is better than a low-V.I. oil in a turbine. He concluded that either type of oil may be used provided it is satisfactory in other respects.

Referring to efforts of many oil refiners to reduce turbine-oil neutralization number down to zero, he said there is evidence that many of these oils, in combination with water, have given rise to excessive iron corrosion with oiling systems, such corrosion products being carried along and interfering with the operation of governors and other parts depending upon close tolerances. This corrosion has been so considerable in some cases that oil suppliers have been accused of furnishing oil which was prone to sludge, whereas it was probably too highly refined as far as retention of natural inhibitors was concerned.

Used turbine oil was found to be an effective rust

Contents . . .

REFINING TECHNOLOGY

December 11, 1940

Lubrication problems involving load capacity of a bearing versus surface finish, apparent solidification of oil at high pressure, turbine oil properties, and new industrial problems in the use of additive oils are discussed at A.S.M.E. annual meeting R-438

Solutizer sweetening is evaluated independent of natural inhibitors and found to preserve inhibitor susceptibility. New "mixed" type solutizer solution leaving inhibitor in gasoline is being used in two new treating plants R-445

Cupric chloride slurry-type sweetening of cracked distillate has no greater chemical cost than doctor sweetening, stops vapor and emulsion losses, and essentially all octane number loss R-450

Catalytic desulfurization's significance with relation to lead susceptibility of straight-run, cracked, polymer, and natural gasolines is discussed before W.P.R.A. by M. W. Conn R-454

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inhibitor when it is mixed with new oil in proportions even as low as 1% of used oil to 99% of new oil and Dantsizen recommended, provided the oil supplier approved, a 10% addition of a well-used oil of the same brand as new oil.

With oils having anti-oxidants present, the amount of acid permissible should probably not exceed that which corresponds to a neutralization number of 0.15. With no anti-oxidants present and depending upon the oil used, an amount equivalent to a neutralization number of 2.5 might be permitted.

A high percentage of organic acids and associated oxidation products were said to give rise to permanent emulsions of water in oil because there is a sufficient number of the hydrophilic groups present to take care of the large contact area between the water globules, which constitute the discontinuous phase of such an emulsion, and the oil which constitutes the continuous phase.

Best Oxidation Test for Lubes

Mr. Dantsizen concluded his paper by describing "one of the best tests for the oxidation characteristics of an oil." This test was developed by Harold Farmer, Philadelphia Electric Co., and was first presented in the "Electrical World" for May 20, 1939. The General Electric laboratory is using a modification of this test. Three eighth-inch diameter rods of iron, brass, and copper, 10 in. long, are placed in a pyrex tube containing 400 ml. of oil and 12 cc of water maintained at 210° F. through which air is bubbled at 10 liters per hour. Samples of oil are tested once a week for neutralization number, viscosity, and precipitation number.

While wide variations exist in the oxidation rate of different oils, at present there is no inclination to condemn some oils which do not prove to be among those giving the best results in the apparatus. "On the other hand," Mr. Dantsizen said, "we appreciate that the oxidation-inhibited turbine oils now on the market are a valuable contribution to the turbine industry."

Additives a Problem to Industry

In a paper covering "A Program for Industrial Lubrication," V. M. Palmer and C. L. Pope, Eastman Kodak Co., made the following comments with regard to new lubricants developed to meet high temperatures and pressures. "Such lubricants when new may or may not differ in physical characteristics from lubricants available several years ago. They do, however, usually follow a different pattern of physical changes during service. Improved refining methods have tended to minimize carbon and asphaltic deposits in high-temperature operation and to reduce the quantity of sludge deposits in circulating systems. Our experience indicated that certain lubricants refined by some of the newer methods are lacking in oxidation stability, film strength, or load-carrying ability, as well as corrosion resistance. These shortcomings are often met by additions to the oil in the form of oxidation and corrosion inhibitors, and in some instances by the use of oiliness additives.

"The use of this type of lubricant presents many problems. For the purpose for which they have been designed, they function well. However, these are special lubricants for special purposes. If used indiscriminately under a wide range of operating conditions, they present a confusing performance picture. This is because some of these addition agents are water soluble and may be washed out either in service or in some types of filters. Others are absorbed by selective types of filters; while still others lose their effectiveness during service. These properties making the reclaiming and reuse of such lubricants inadvisable."

They conclude that "lubricants from all sources and refining methods have both good and bad features. By blending and refining, emphasis can be placed on any desired characteristic at the sacrifice of some other properties. The tendency to minimize or entirely disregard the undesirable properties is likely to lead to some misconceptions in evaluating lubricants."

Condenser Tube Service Depends on Fabrication

The results of a series of corrosion and impingement tests with miniature condenser with tubes made of Admiralty metal, aluminum brass, and cupronickel operating under conditions as closely as possible a duplication of those existing in a working condenser for steam prime mover service, were presented in a paper by C. W. E. Clarke, United Engineers & Constructors, Inc., A. E. White and C. Upthegrove, University of Michigan.

They conclude that aluminum brass, for the specific water conditions pertaining to this specific investigation, is superior in its corrosion resistance to cupronickel, Admiralty metal, and bronze. Microstructure, as such, does not appear to be a controlling factor. A hard-drawn or an annealed material may show equally good corrosion-resistance properties. Internal stresses of an order to produce cracking, under the conditions of the standard A.S.T.M. mercurous-nitrate test, do not necessarily decrease the corrosion resistance of the tubes, nor does their absence necessarily increase the corrosion resistance. Arsenic nor phosphorus do not appear to be controlling factors. Proper manufacturing procedure is, beyond any question of doubt, an important factor in the production of highly corrosion-resistant aluminum-brass tubes, they conclude.

Furnace Radiation Clarified

Data of various investigators on the emission and absorption of radiation by carbon dioxide and water vapor in combustion gases were reviewed by H. C. Hottel and R. B. Egbert, Massachusetts Institute of Technology. They made recommendations of procedure in calculation of heat transmission by gas radiation, including charts and mathematical formulas. They conclude that the partial pressure of water vapor affects gas radiation, but probably to a much smaller extent than has been reported in previous literature. A simplified procedure was presented to allow for the effect of the gas shape on radiant heat exchange.

Thermometric Time Lag

Facts and theory of thermometric time lag in a form suitable for industrial users of thermometers, were presented by Rudolf Beck, Manning, Maxwell, and Moore, Inc. Emphasis was on the distant-reading type of thermometer, actuated by liquid expansion (mercury or other liquids), gas expansion, or vapor pressure, and mercury-in-glass thermometers.

The data presented by Mr. Beck was intended to give the user of a thermometer sufficient material to determine its behavior under actual service conditions for a definite time-lag figure. He proposed the following as a standard form of time-lag specification:

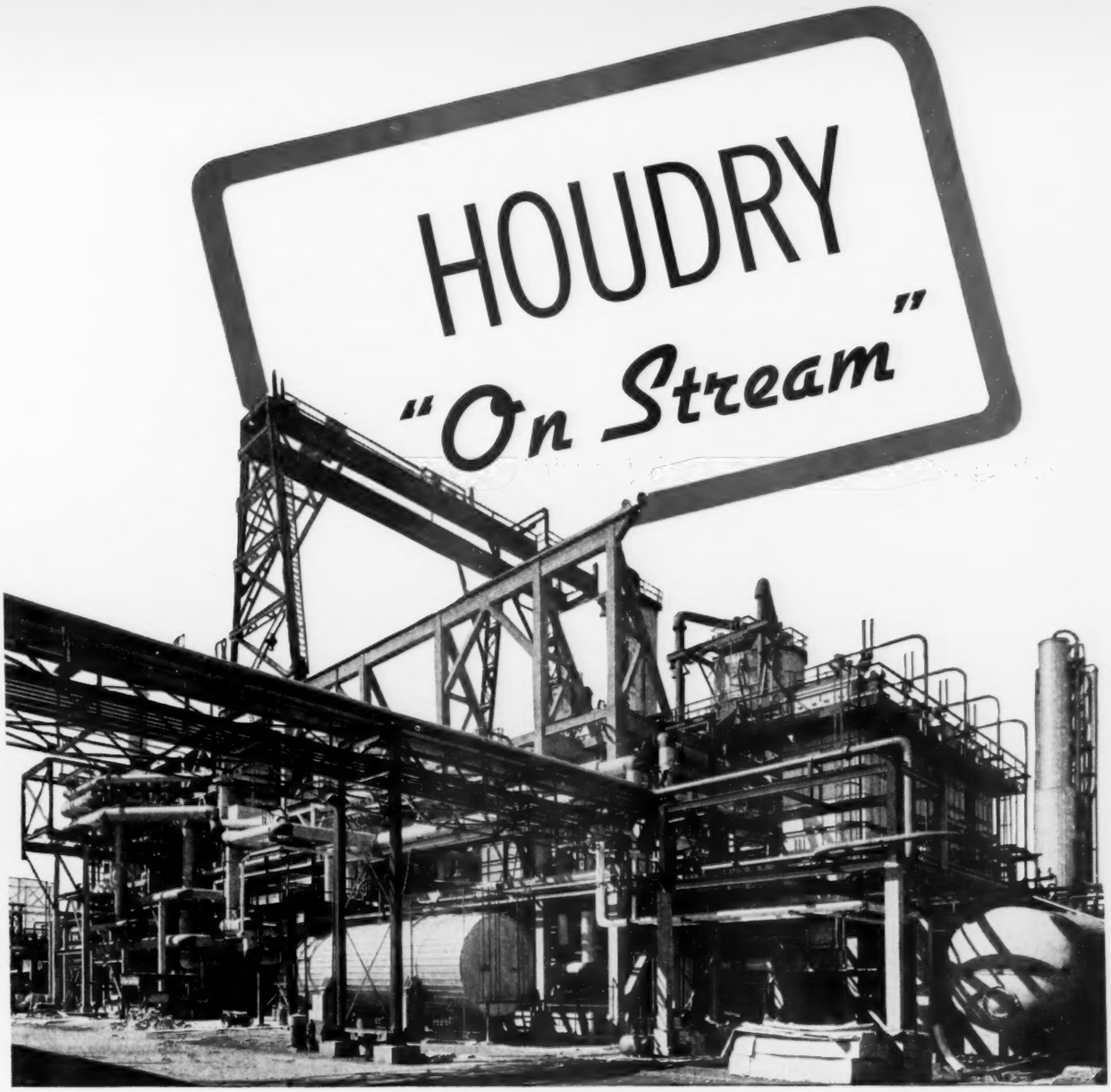
"The time lag of the thermometer in (medium) at a uniform rate of temperature rise must not exceed ( ) seconds.

"The time lag is to be determined by transferring bulb at temperature T_a into a (medium) bath at temperature T_b and measuring the time required for the indication to progress from T_s to $T_c = T_b - 0.368\ (T_b - T_s)$ with bulb at rest and bath stirred moderately. This figure will be accepted as representing the time lag in (medium) at a uniform rate of temperature rise."

Actual figures should be inserted for the temperatures indicated.

Correction

Captions describing photographs of Shell Chemical Co.'s gas reform and reactor plants at Pittsburg and Dominguez, Cal., were reversed on pages R-409 and R-410, Nov. 13.



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. . . and another unit reported in August the completion of 157 days "on stream" with 96.6% time efficiency.

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New Thermofor Kiln Data Shown at A.I.C.E. Meet

NEW ORLEANS—New operating data on the Thermofor kiln are further demonstrating the economic advantage of this type of burning unit over the multiple hearth kiln and rotary burner for regenerating percolation clays used in petroleum refining, according to T. P. Simpson, E. S. Nicholls and J. W. Payne, Socony-Vacuum Oil Co., in a paper delivered here today before the Thirty-third annual meeting of the American Institute of Chemical Engineers. Introduced to the petroleum industry a little over a year ago, the kiln is now being used on a commercial scale in 4 refineries. Savings of $11,000 to $23,000 per 100,000 bbls. of oil percolated are claimed.

Thermofor kilns provide close control of clay burning temperatures by means of a heat transfer system using a molten salt to absorb the heat of combustion, the authors stated. The newest Thermofor kilns employ spiral finned heat transfer tubes, which permit advantages in construction, maintenance and operation of the units.

One commercial unit has now been in operation for almost two years with a 99% service factor. The efficiency of clay burned in this unit after 18 months operation is still about 100%. A 120-ton-per-day unit has been constructed for general refinery service and for activating clays to remarkably high efficiencies by carbonization.

Of the more recent installations, one 10-ton-per-day unit is being used with excellent results for burning bauxite employed in percolating waxes. Prior to the introduction of the Thermofor kiln, investigations of other burning units for possible use in this plant had shown them to be unsatisfactory because of their large size and lack of operating flexibility under small-capacity conditions. The new type kiln offered distinct economic and operating advantages under the prevailing conditions.

While the Thermofor kiln was developed mainly to achieve increased efficiency in clay regeneration for the petroleum refining, its basic design embodies general characteristics which make it well suited for uniformly burning, heat treating, reacting or drying granular solids in contact with a vapor stream under controlled temperature conditions. In this respect, it would appear to have broad application in the chemical and industrial processing field. A number of possible applications have been suggested, such as regenerating bone char used in sugar refining, heat treating or burning ores, particularly in operations where it may be desirable to recover vapors—such as SO_2 from sulfide ores, roasting, heat treating or drying of granular foods, and distillation of oil from shale.

The outstanding characteristics of the kiln are outlined in the paper as follows:

"1. The temperature of the clay or other solid being burned or heat treated is positively controlled by providing adequate heat transfer surface to absorb the heat of combustion.

"2. The distribution of air through the material being burned is uniform. Air consumption is low due to excellent combustion conditions and the counter-current flow of air to spent adsorbent. The oxygen content of the flue gases is normally less than 1%.

"3. In normal operations no outside fuel is necessary to attain the required burning temperatures, the necessary heat being supplied by combustion of the carbonaceous deposits associated with the spent clay. Except when the unit is being run to carbonize clay or for burning adsorbents containing exceptionally light deposits of carbonaceous material, the only outside heat supplied is for bringing the burner up to temperature or for hardening raw clays.

"4. Maintenance is low because the kiln proper contains no moving parts. Oxidation-resistant alloy steels used in constructing the heat transfer elements have shown good resistance to oxidation and corrosion. Inspection of a good commercial unit after 13 months of continuous service showed no measurable erosion or corrosion. Likewise, mechanical operating difficulties are comparatively few."

Disregarding investment and amortization considerations and basing comparisons strictly on an operating cost basis the data given in Table I illustrate the effect of clay efficiency on cost of percolating typical lubricating oils, according to the authors.

The comparisons of Table I are based on percolation operations for solvent refined residual lubricating stocks of 70-100 seconds S.U.V. at 210° F. for decolorization from 8 N.P.A. to 5 N.P.A. color, and filter yields of 15-25 bbls. per ton of clay. Operations of this nature are common in lubricating oil refining. In this table, the standard for comparison is the 100% efficiency fresh clay shown in the first column. Since clays show variations in decolorizing power, which are noticeable even between different batches of the same brand name, it is always necessary for comparative purposes to standardize used clay efficiencies against the fresh clay from which it was derived and this practice is followed throughout this paper.

Table I

Relative Manufacturing Costs for Percolation Filtration of 100,000 Barrels of Typical Lubricating Oil Through Various Clays

Average Overall Clay Efficiency	100%	67%	80%	80%	100%	200%[1]
Type of Regeneration	Tempering	Multiple Hearth	Multiple Hearth	Thermofor	Thermofor	Thermofor Carburization
Number of Cycles Used	1	10	5	No segregation or discard	No segregation or discard	No segregation or discard
% Fresh Clay Makeup per Cycle	100	12[2]	22[2]	2[3]	2[3]	2[3]
Cost of Clay at $22/Ton	$56,000	$10,000	$15,300	$1,390	$1,110	$560
Burning Cost	2,620	3,800	3,260	2,670	2,150	1,075
Oil and Naphtha Loss and Filter Steam	8,800	13,150	11,000	11,000	8,800	4,400
Relative Operating Costs[4]	$67,420	$26,950	$29,560	$15,060	$12,060	$6,035

[1] Oil percolated responds to clay reactivated by carburization.
[2] To replace clay discard and handling loss.
[3] To replace handling loss.
[4] Includes only costs affected by change in clay efficiency.

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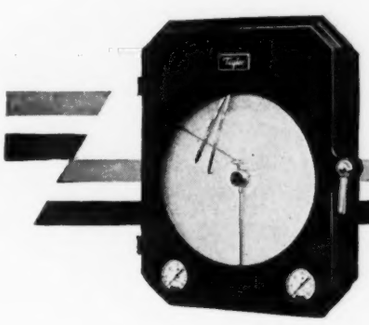

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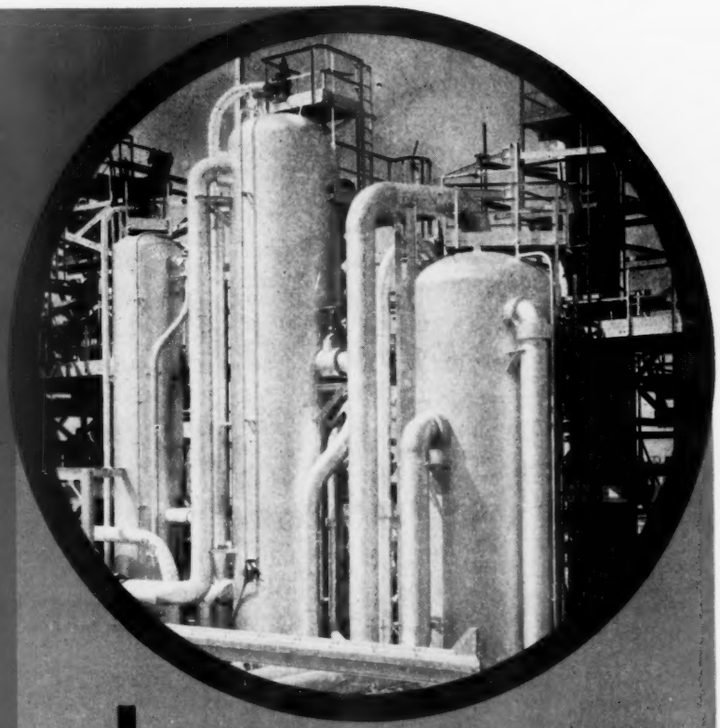

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Solutizer Sweetening Preserves Inhibitor Susceptibility

By D. L. Yabroff, E. L. Walters, A. C. Nixon, and H. B. Minor*

ABSTRACT

Evaluation of the influence of the Solutizer treating process, and of any treating process, on gasoline stability must take into account the separate effects of the particular process itself and of the natural inhibitors that may be present. A method for doing this, based upon the "basic inhibitor susceptibility" of the gasoline, has been developed and is more effective than the diazo reaction. Solutizer sweetening is shown to preserve inhibitor susceptibility.

Utilization of a "mixed" type solutizer which leaves in gasoline so sweetened the inhibitor alkyl phenol, is announced in two new commercial solutizers plants just starting operation in California, for sweetening full range cracked gasolines. The "mixed" solution contains both isobutyrate and alkyl phenolate salts and the presence of alkyl phenol is the result of the equilibrium established with the alkyl phenol salts in the solutizer solution.

THE solutizer process marks a distinct advance in gasoline sweetening because the mercaptans are removed completely from the gasoline, instead of being converted to disulfides with the accompanying traces of polysulfides or soluble metal salts. The treating agent employed in the solutizer process is a strong caustic solution to which has been added a suitable organic material, termed a "solutizer," and this results in a caustic solution of "high solvency power" for mercaptans. Previous publications (1) have discussed the underlying theory of the process, the extraction and regeneration steps, the attractive improvement in octane number and lead susceptibility as compared to the untreated sour gasoline, pilot plant studies, and finally the operation of a 15,000-bbl.-per-day commercial plant at the Wood River refinery of Shell Oil Co., Inc. The effect of solutizer sweetening on the stability characteristics of the gasoline is discussed here with particular emphasis on the inhibitor susceptibility.

The stability of a cracked gasoline may be considered as arising from two main factors: (1) inhibitors, and (2) refining. The role played by oxidation inhibitors, either the natural alkyl phenols or the various synthetics, is a very important one, and indeed, can hardly be overemphasized. There is evidence for the belief that refining processes such as acid or clay treating improve stability by conditioning the gasoline so as to improve its response to the action of inhibitors. This, of course, is done by polymerizing and removing the more unstable gasoline constituents. The importance of inhibitors becomes evident through the fact that we have never encountered a cracked gasoline, no matter how severely refined, that will pass the conventional stability tests after all of its inhibitor has been removed.

In evaluating the influence of a given treating process on the stability characteristics of a cracked gasoline, it is important to be able to separate the effect of the particular process itself from the effect of the natural inhibitors that may be present. Changes brought about simultaneously in the natural inhibitor content of the gasoline and in its stability may often obscure the real effect of the treating process, and may lead to erroneous conclusions. Failure to adequately take this factor into account has lessened the value of much published work.

The first commercial solutizer unit at Wood River, Ill., has a capacity of 15,000 bbls. per day. The solutizer stripping tower in the foreground is 6 ft. in diameter and 48 ft. high. The extraction tower in the background is 5 ft. in diameter and 58 ft. high

In order to eliminate this troublesome variable, the diazo reaction has been resorted to (2) in an attempt to obtain gasoline samples entirely free of natural inhibitors. The induction period of the inhibitor-free gasoline was apparently used as the criterion for gauging the degree of refining obtained. A limitation of the diazo reaction, pointed out by Newton (2), is that not all phenols will react in this manner, especially those that contain groups substituted in all three ortho and para positions.

In studying the stability of cracked gasolines, we have employed a particular solutizer solution in the laboratory to obtain inhibitor-free samples, and this procedure appears to be more effective than the diazo reaction. Known amounts of given inhibitors are then added to the completely *uninhibited* gasoline and their effect on the induction period is determined. Such a procedure allows the evaluation of what we have called the "basic inhibitor susceptibility" of the gasoline in question, and the true

*Shell Development Co., Emeryville, Cal.

effect of a given treating process on this property may therefore be readily determined. The susceptibility of a gasoline to inhibitor is a most important property, not only from the standpoint of actual inhibitor requirement, but also because it goes hand in hand with other stability characteristics of the gasoline. Indeed, we can go so far as to say that any treating process that improves the basic inhibitor susceptibility of the gasoline has also improved other stability properties; conversely, a decrease in the basic inhibitor susceptibility means an impairment of the gasoline stability.

Laboratory Removal of Inhibitors

The data of Table 1 show the extent to which natural alkyl phenol inhibitors were removed with the diazo reaction, following Newton's procedure with our K-2 solutizer solution. The gasoline employed in these experiments was an acid treated and doctor sweetened full range cracked gasoline. The solutizer treatment was performed by cooling the gasoline to 0° C. and extracting in a separatory funnel with 10% vol. of precooled K-2 solutizer (6N potassium hydroxide—3N potassium isobutyrate). It will be noted in Table 1 that one solutizer treatment removed almost all of the natural inhibitors from the gasoline and complete removal was obtained by two such treatments. Three diazo treatments, on the other hand, did not remove all the natural inhibitors, and the induction period of the resultant gasoline was even slightly higher than that of the sample treated but once with K-2 solutizer. In the laboratory, two 10% vol. extractions with the K-2 solution are generally employed to insure complete inhibitor removal. Absence of inhibitors in K-2 solutizer-treated gasoline and resultant instability make it important to test or to reinhibit immediately.

The data of Table 2 are presented in order to show that the complete removal of inhibitors by the K-2 solutizer treatment has no other effect on the stability properties (except also to sweeten the gasoline simultaneously if it is sour). In these experiments a portion of the same gasoline used above was K-2 solutizer treated and then inhibited with 50 mg./100 ml. of an alkyl phenol type inhibitor known as 4T. The inhibited gasoline sample was then successively extracted with K-2 solutizer and reinhibited. Comparing items 3, 5, 7, and 9 of Table 2, it is seen that the effectiveness of a given amount of 4T inhibitor in this gasoline is not changed even by four solutizer extractions followed by reinhibition in each case.

Inhibitor Susceptibility Improved

Data are presented in Table 3 for several different cracked gasolines, showing the effect of solutizer sweetening and plant doctor sweetening on the basic inhibitor susceptibility. In these experiments the sour and the corresponding plant doctor sweetened gasolines were treated with K-2 solutizer which removed all natural inhibitors and simultaneously sweetened the sour gasoline. The effectiveness of known amounts of 4T inhibitor in the completely *uninhibited* samples was then determined. As shown in Table 3, the susceptibility of the solutizer treated gasolines was much greater in every case than that of the doctor treated gasolines. In order to reach an induction period of 300 minutes, starting with the uninhibited samples, the various solutizer sweetened gasolines required only from 49 to 78% as much inhibitor as the doctor treated gasolines.

Solutizer treating may be considered as a mild refining since it removes mercaptans from the gasoline. However, it is likely that the reason for the higher inhibitor susceptibility of solutizer sweetened gasoline is to be attributed largely to the fact that no deleterious products are introduced during the course of sweetening. Solutizer sweetening therefore preserves the inhibitor susceptibility and other stability properties of the gasoline, while many other sweetening methods bring about a degradation in these properties.

From a practical point of view, the presence of alkyl phenols in gasoline is desirable, and we wish to retain at least a portion of them in the treated product. This is done by employing a so-called "mixed" solutizer which

Table 1

Removal of Natural Inhibitors from a Cracked Gasoline With the Diazo Reaction (2) and with K-2 Solutizer Solution*

Treatment	Induction Period, Minutes** After 0 to 3 Treatments			
	0	1	2	3
None	395	..	..	..
Diazo	...	95	45	30
Solutizer	...	25	15	15
Diazo & Solutizer	...	..	15	..

*6N potassium hydroxide—3N potassium isobutyrate.
**At 100° C. and 100 pounds oxygen gauge in U.O.P. type bombs. A 30-min. correction has been subtracted from the observed induction periods to correct for the heating-up lag of the gasoline in the bombs.

Table 2

Removal of Inhibitors from a Cracked Gasoline by Solutizer Treatment, followed by Reinhibition

Item No.	Gasoline Treatment	Induction Period, minutes
1	None—Original Gasoline	395
2	Item (1), K-2 Solutizer Treated*	25
3	Item (2), plus 50 mg./100 ml. of 4T Inhibitor	455
4	Item (3), K-2 Solutizer Treated*	20
5	Item (4), plus 50 mg./100 ml. of 4T Inhibitor	465
6	Item (5), K-2 Solutizer Treated*	20
7	Item (6), plus 50 mg./100 ml. of 4T Inhibitor	455
8	Item (7), K-2 Solutizer Treated*	20
9	Item (8), plus 50 mg./100 ml. of 4T Inhibitor	455

*One 10% vol. batch extraction.

Table 3

Effect of Solutizer Sweetening and Plant Doctor Sweetening on the Basic Inhibitor Susceptibility of Several Cracked Gasolines

(Sour and plant doctor sweetened gasolines extracted with K-2 solutizer to remove all inhibitors and to sweeten the sour gasoline. Known amounts of 4T inhibitor then added to completely uninhibited samples.)

Gasoline No.	Conc. of 4T Inhibitor Added back to Uninhibited Gasolines, mg./100 ml.	Induction Periods at 100° C. and 100 lbs. Oxygen, minutes		Amount of 4T Inhibitor Required in Uninhibited Gasolines for a 300 minute Induction Period, mg./100 ml.		Ratio of Inhibitor Requirements, Solutizer Sweetened to Plant Doctor
		Sweetened by Solutizer	Sweetened by Plant Doctor	Sweetened by Solutizer	Sweetened by Plant Doctor	
1	0	10	10			
	20	235	145	28	51	0.55
	40	375	250			
2	0	35	25			
	20	380	325	14	18	0.78
	40	605	570			
3	0	10	10			
	20	330	180	18	37	0.49
	40	520	320			
4	0	15	15			
	20	300	200	20	31	0.51
	40	525	375			

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Table 4

Effect of Treating with a "Mixed" Solutizer (Contains both Isobutyrate and Alkyl Phenolate) on the Induction Period of Cracked Gasolines

Item No.	Induction Period at 100°C. and 100 lbs. Oxygen, minutes	
	Untreated Sour Gasoline	After treatment with K-20 Solutizer
1	40	525
2	70	315
3	75	100
4	75	185
5	75	740
6	95	225
7	110	355
8	125	335
9	150	260
10	270	220
11	305	300
12	315	130

contains both isobutyrate and alkyl phenolate salts. A typical solution of this type, designated as K-20, has the following composition: 6N free KOH—1.5N potassium isobutyrate—13.5% vol. alkyl phenol (as the salt). The gasoline sweetened with such a solution contains a more or less definite amount of alkyl phenols because of the equilibrium established with the alkyl phenol salts in the solutizer solution itself. Experiments have shown that this equilibrium amount of alkyl phenols in the gasoline is about 0.02% vol. for the K-20 solutizer.

The effectiveness of this amount of alkyl phenol as an inhibitor in a given gasoline depends on the inhibitor susceptibility. This latter property is of course affected by the extent of the previous refining of the gasoline, the presence of certain deleterious impurities, the gasoline composition, etc. In many cases, the amount of alkyl phenols imparted by the K-20 solution may be more than sufficient to assure adequate stability. In the case of some poorly treated gasolines it may be necessary to add further amounts of inhibitor.

This is illustrated by the data of Table 4 which gives the induction periods of a number of sour cracked gasolines, before and after treatment with the K-20 solution at room temperature. As expected, there is no relation between the induction period of the untreated and the solutizer treated gasoline, since the latter is dependent essentially on the inhibitor susceptibility of the gasoline. It will be observed that the induction periods of the treated samples range from 100 minutes to as high as 740 minutes.

Table 5

Properties of the Gasolines of Table 4

Item No.	—A.S.T.M. Distillation, °F.— I.B.P.	10%	50%	90%	F.B.P.	A.P.I. Gravity	Bromine Number (3)	Sulfur, % wt., of Sour Gasoline Total	Mercaptan (4)
1	99	126	198	268	302	68.9	98	0.31	0.057
2	84	114	216	360	414	71.1	157	0.14	0.045
3	109	158	260	354	389	57.9	92	0.13	0.037
4	99	127	241	378	410	59.8	91	0.14	0.022
5	102	136	244	351	383	61.3	77	0.14	0.015
6	92	131	239	339	378	62.5	83	0.28	0.111
7	108	145	246	311	334	62.3	91	0.45	0.041
8	111	164	259	353	388	60.7	38	0.09	0.016
9	97	154	271	379	408	58.3	60	0.03	0.005
10	117	165	255	361	412	58.1	55	0.04	0.004
11	105	145	241	332	377	60.9	46	0.09	0.022
12	95	131	237	331	363	63.7	91	0.64	0.173

The properties of the gasolines of Table 4 are listed in Table 5.

In the commercial application of the solutizer process, we therefore use a solution of the mixed type when treating full range cracked gasolines in order not to extract all of the natural inhibitors from the gasoline. When treating straight-run gasolines, a straight isobutyrate solution (such as K-2) is employed. Low boiling cracked gasolines or reformed gasolines that contain no natural alkyl phenol inhibitors are often treated with the straight isobutyrate solution and then inhibited or blended with gasolines that do contain natural inhibitors.

The 15,000-bbls./day solutizer plant at Wood River uses the K-2 solution to treat a blend of full range reformed and light cracked and straight-run gasolines. The treated material is blended with a heavy cracked gasoline that contains natural alkyl phenol inhibitors. Two new plants about to begin operation at the Martinez and Dominguez (Cal.) refineries of Shell Oil Co., Inc., will treat full range cracked gasoline and will employ a mixed type solutizer solution for this purpose.

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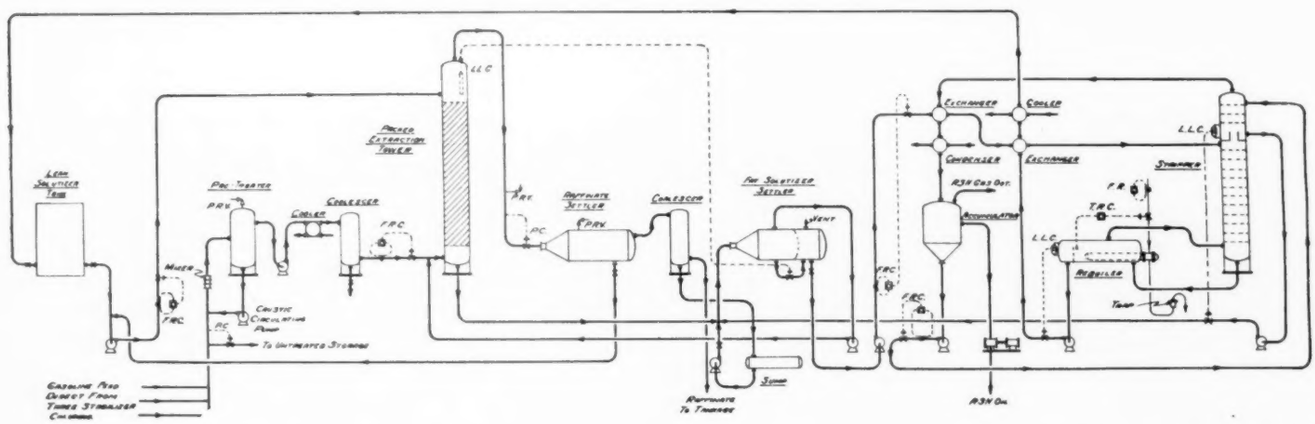
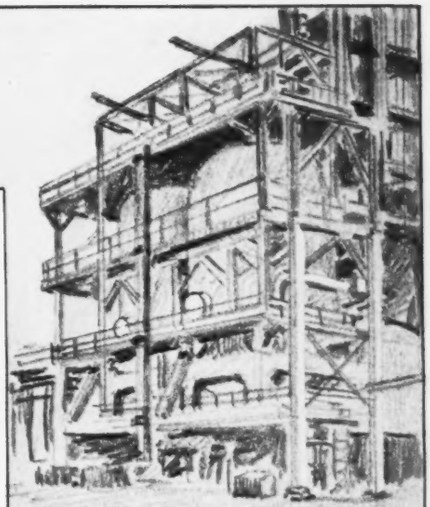
15,000-Barrel Solutizer Treater at Wood River

The first commercial solutizer treating plant, was placed in operation at the Wood River refinery of Shell Oil Co., May 17, 1940. It is a 15,000-bbl.-per-day unit treating a blend of straight-run plus 30-50% cracked and reformed gasoline and providing complete removal of mercaptans. It is reported to have shown an overall saving of approximately 5 cents per barrel over conventional doctor treatment. Savings result from the increase in octane number and lead susceptibility of gasoline so treated. The tetraethyl lead requirement to 75 and 80 octane number is said to be reduced 0.27 cc. and 0.90 cc., respectively, by solutizer treatment.

Ease of control, low utility requirements and negligible chemical consumption, making operating costs low and low gasoline losses are given as advantages of the process. The most outstanding advantage, however, is said to be the increase in octane number and lead susceptibility which results from removal of pro-knock mercaptans from the gasoline.



Flow diagram for the 15,000-bbl. solutizer plant at Wood River. The solutizing agent is the potassium salt of isobutyric acid dissolved in potassium hydroxide solution



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This is an accurate description of the Gray Process because the undesirable gummy materials are removed by Polymerization without the loss of desirable gasoline or octane rating.

GRAY CLAY TREATING

Slurry-Type Copper Treater Stops Octane Number Losses†

R. G. Atkinson*

ABSTRACT

Cupric chloride slurry-type sweetening of cracked distillate and various other gasoline stocks has been accomplished at essentially the same chemical cost as was previously spent on doctor treating and has eliminated all vapor loss, emulsion losses, and essentially all octane number loss.

The chemical cost of treating pressure distillate, including cost of inhibitor and deactivator, was 1.73 cents per bbl. and for catalytic polymer was 1.22 cents per bbl. Stocks sweetened by this process have been found to be stable in storage. Yellow pressure distillate stored for a year had an ASTM gum of 2.0 mg. per 100 cc.

SEVERAL processes for sweetening gasoline by means of reduction of cupric chloride have reached an advanced stage of development and have attracted interest among many refiners. One such process, known as the Linde copper sweetening process, or sometimes referred to as the Linde slurry-treating process, has been giving very satisfactory results for the past year at the refinery of Shamrock Oil & Gas Corp. at Sunray, Tex. Many types of stocks have been treated at the Shamrock plant, among which are clay treated pressure distillate, raw or yellow pressure distillate, and polymer from a U. O. P. catalytic polymerization plant. A description of the individual stocks before and after treating appears in the table accompanying this article. This new treating plant has sweetened the various gasoline stocks at essentially the same chemical cost as was previously spent on doctor treating and has eliminated all vapor loss and emulsion losses and essentially all octane loss.

The sweetening takes place through the reduction of cupric chloride by the mercaptan to form the end products cuprous chloride, alkyldisulfide, and hydrochloric acid. The sweetening reaction may be written thus:—

$$\underset{\text{Cupric Chloride}}{2\,CuCl_2} + \underset{\text{Mercaptan}}{2RSH} \rightarrow \underset{\text{Cuprous Chloride}}{2\,CuCl} + \underset{\text{Disulfide}}{RSSR} + \underset{\text{Hydrochloric Acid}}{2\,HCl}$$

In order to obtain continued operation the cuprous chloride is regenerated to the cupric form by oxygen which is added to the sour gasoline as it enters the treater. The regeneration reaction takes place in the reactor simultaneously with the sweetening reaction and may be written as follows:—

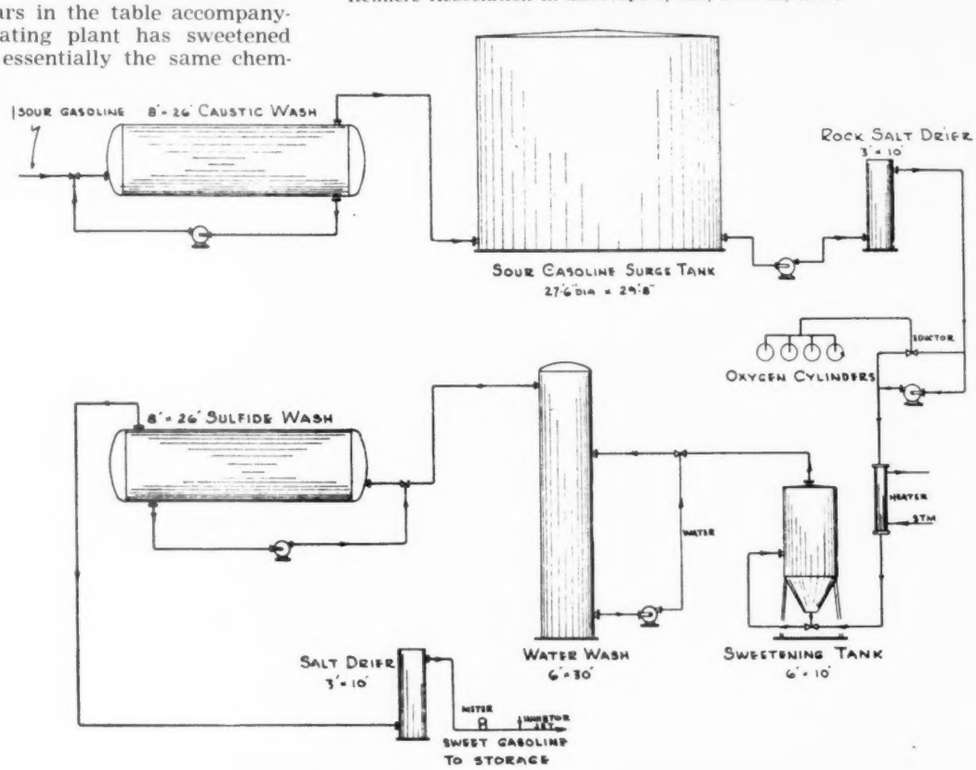
$$\underset{\text{Cuprous Chloride}}{2\,Cu\,Cl} + \underset{\text{Hydrochloric Acid}}{2\,HCl} + \underset{\text{Oxygen}}{\tfrac{1}{2}\,O_2} \rightarrow \underset{\text{Water}}{H_2O} + \underset{\text{Cupric Chloride}}{2\,Cu\,Cl_2}$$

Flow Through the Plant

Separate units are installed for the treatment of pressure distillate and polymer, however. The units are entirely similar except in size of vessels and pumps. The accompanying diagram is a flow chart giving the size of the various vessels used for treating approximately 1500 barrels of pressure distillate per day.

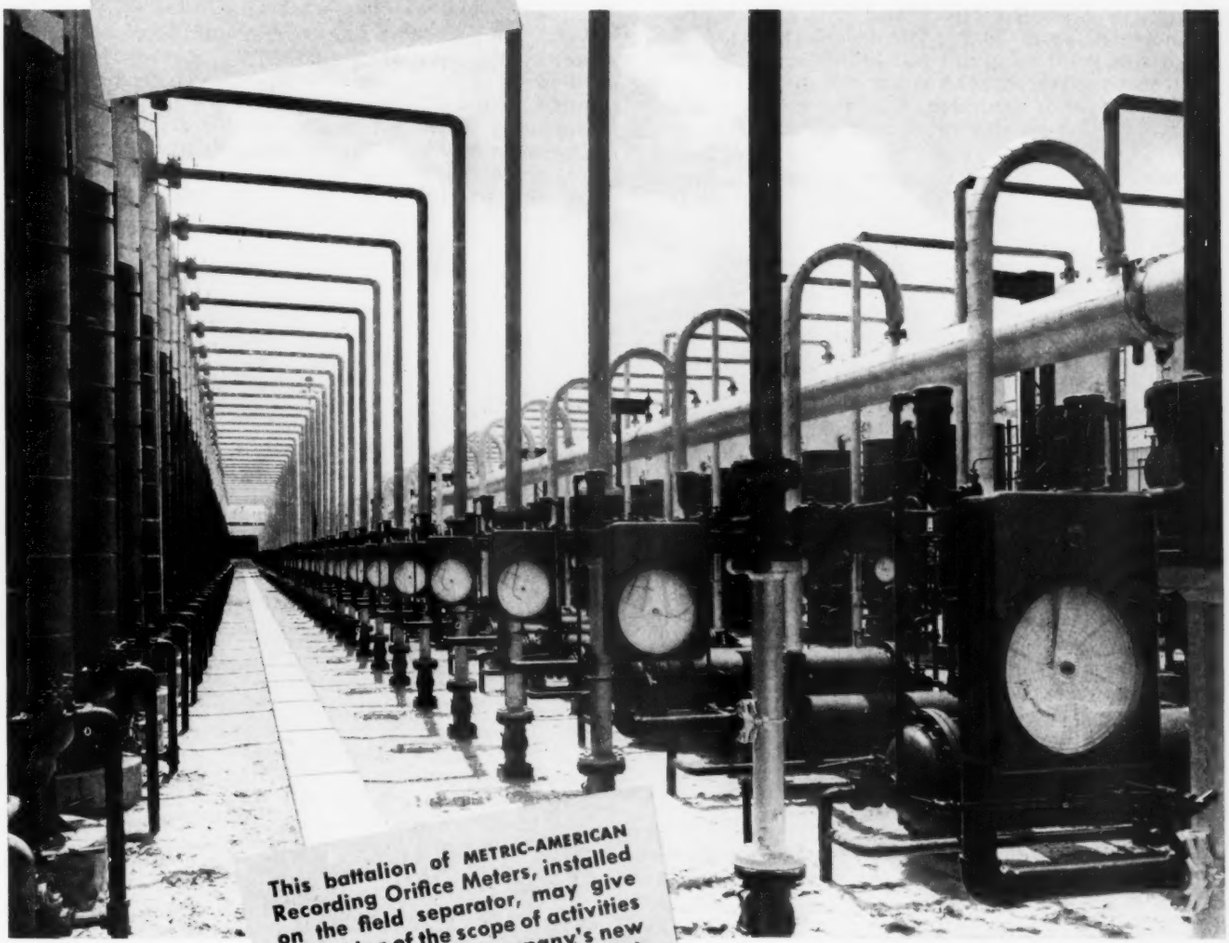
Debutanized stock from a Dubbs cracking unit passes

*Chief Chemist, Shamrock Oil and Gas Corp.
†Presented at the regional meeting of the Western Petroleum Refiners Association in Shreveport, La., Oct. 25, 1940.



Flow chart of the Linde slurry-type sweetening process at the refinery of Shamrock Oil and Gas Corp., Sunray, Texas

INDUCTED INTO HARD SERVICE



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through a caustic scrubber into the sour gasoline surge tank. The material is picked up from this tank by a low head centrifugal pump and passed through a rock salt drier from which it is discharged into the suction of a second centrifugal pump capable of boosting pressure to 90 psi. There is an eductor in the by-pass line between the discharge and suction of the second pump, by which the oxygen necessary for regeneration of the cupric chloride is introduced into the gasoline. The oxygen line from the manifolded oxygen cylinders is equipped with a mercury seal to safeguard against any gasoline backing up into the oxygen supply.

Before entering the sweetening tank the distillate passes through a small steam heater where its temperature is increased about 10°F. The temperature is raised slightly at this point to insure full saturation of the sour stock entering the treater with water. Since the distillate leaving the treater is saturated, a means is provided for removing the water formed by the regeneration reaction.

The charge flows from the heater through an eductor at the base of the cone bottom sweetening tank where it is mixed with the clay and cupric chloride slurry. This eductor which draws the slurry from the bottom of the tank where it has settled and mixes it intimately with the gasoline operates at a pressure drop of about 70 psi. The gasoline and slurry mixture is discharged into the side of the sweetening tank where enough settling time is provided to allow the slurry to settle to the bottom and for clear gasoline to flow out the connection in the top of the vessel.

The gasoline from the top of the sweetening tank is given a water wash, then a sodium sulfide wash to remove small amounts of clay or copper carried out of the treater. The product then passes out of the plant through a proportioning meter which controls the addition of inhibitor and copper deactivator.

Operating Factors

The purpose of the caustic wash is to remove hydrogen sulfide which must be kept out of the sweetening tank in order to prevent the copper reagent from being converted into cupric sulfide. Sufficient settling time is allowed in the wash tank to prevent entrainment of caustic which must also be kept out of contact with the sweetening reagent. The salt filter, used before the sweetening tank, is an additional precaution.

The initial charge of reagent for a reactor treating about 1500 barrels per day of pressure distillate is 200 lbs. of 200-mesh clay and 20 lbs. of cupric chloride. This is made up as a simple mechanical mixture of the 2 dry components, i.e. it is not necessary to impregnate the cupric chloride on the clay. The use of "dry" or "solid" cupric chloride prevents any possibility of corrosion. Due to slight carry-over of clay and copper into the water wash tank it is necessary to make periodic additions of clay and cupric chloride to the treater. The addition of 25 pounds of clay and 2½ pounds of cupric chloride every 8 hours has been found sufficient to keep the correct quantity of slurry in the treater. When pressure distillate that has been previously "clay treated" is being sweetened it has been found that a charge of slurry will last indefinitely without being renewed. However, with raw or yellow pressure distillate the clay in the treater becomes oily and "balls up" after 30 or 40 days of operation and it is then necessary to renew the entire charge of slurry.

It is observed from the sweetening and regeneration reactions given that the stoichiometric amount of oxygen required is one-half mol. for every 2 mols. of mercaptan reacted. The amount of oxygen consumed in excess of this theoretical requirement is exceedingly small or negligible and it has been found practical to make oxygen additions based on the following rule:—

> Oxygen required per bbl. treated per hour = .015 cu. ft. per mg. of mercaptan sulfur in 100 cc of sour stock.

A deficiency in the amount of oxygen added shows up very quickly since there is only a small amount of cupric chloride present in the system and when this is used up the treater will stop sweetening. This point is really of assistance in eliminating difficulties since it prevents operating in the presence of an appreciable concentration of cuprous copper which may cause serious copper carry-over with resulting gum trouble in the gasoline. When the proper amount of oxygen is added to the sour stock the copper is essentially all removed by the sulfide wash and a negative test for copper by the dithizone* test method is normally obtained. However, a small amount of copper deactivator is added as a safeguard. Sodium sulfide wash is used because there is a large supply available from spent caustic solutions which have been used for removal of hydrogen sulfide. This probably results in reduction of the amount of copper deactivator required, but if necessary, copper deactivator could be used exclusively and the sodium sulfide wash eliminated.

The most desirable temperature for operating the sweetening tank is around 80°F. If the temperature is allowed to drop below 70°F. the sweetening reaction is much slower. Inasmuch as the stock is quite sour, it was necessary to equip this plant with a steam heater so that the temperature of the gasoline entering the treater will not be below 70°F. In summer the tank has been operated as high as 110°F. but under these conditions some color drop is encountered in the treated stocks.

Properties of Stocks Before and After Treating

	CLEAR PRESSURE DISTILLATE		YELLOW PRESSURE DISTILLATE		POLYMER	
TEST	Sour	Sweetened (Plus Inhibitor)	Sour	Sweetened (Plus Inhibitor)	Sour	Sweetened (Plus Inhibitor)
ASTM GUM.	0.2 mg	0.2 mg	1.0 mg	1.8 mg	Nil	Nil
Cu. Dish Gum	12 mg	14 mg	10.5 mg	16 mg	11 mg	10 mg
Induction Period	500 min.	600 min.	390 min.	500 min.	240 min.	320 min.
ASTM Octane	62	62	64	63.8	82	81.8
Color	30	27	Yellow	Yellow	30	27
Sulfur	0.08%	0.08%	0.11%	0.10%	0.02%	0.03%
Mercaptan Sulfur	0.04%	None	0.05%	none	0.005%	none

NOTE: The clear pressure distillate was given a previous clay treatment.

Based on a year of operation the chemical cost of treating pressure distillate including the cost of inhibitor and deactivator has been determined as 1.73 cents per bbl. and the cost of treating catalytic polymer 1.22 cents per bbl. The stocks sweetened by this process have been found to be absolutely stable in storage as is evidenced by the fact that some yellow pressure distillate which had been in storage for a year had an ASTM gum of 2.0 mg. per 100 cc. The yellow pressure distillate leaving the sweetening plant is inhibited with 0.0015 per cent of DuPont's Antioxidant number 14 and 1 lb. of DuPont's color stabilizer S (copper deactivator) per 1000 bbls. The inhibitor requirements of the clay treated pressure distillate are much less than this and the inhibitor requirement of catalytic polymer is negligible.

* * *

Discussion

In the discussion it was brought out that the process was licensed under the original Hoover patent on dry cupric chloride. As operated at the Shamrock plant, the process holds up the octane number in contrast with what was thought to be a good doctor plant which gave a loss of about two octane numbers. A. W. Trusty, Arkansas Fuel Oil Co., asked for information about gum tests of the treated gasoline. Mr. Atkinson's reply was that the induction period decreases and the copper dish gum increases when treating this particular stock with any system, since there is evidently a natural inhibitor there. When it passes through the caustic wash, this natural inhibitor is evidently taken out. This leaves a 60-minute induction period and a copper dish gum of 300-400 milligrams.

Questioned about replacement of the eductor in the bottom of the treating vessel, by H. B. Chamberlain, Magnolia Petroleum Co., it was found that replacement of a $3 jet in the Schute-Koerting eductor, at 30 to 90-day

*National Petroleum News, April 19, 1939, p. R-162.

Color Cast Carbon

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Pennsylvania Cylinder Stock before treatment . . .		darker than 8	2.06
Contacted at 550° F.			
20 minutes 550° F.	0.35	7	1.80
20 minutes 550° F.	0.60	6½	1.65
20 minutes 550° F.	1.00	6	1.54

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intervals, is all that is necessary and is about the only item of maintenance so far. In the sodium sulfide wash, used in the final stage of treatment, the question was raised as to whether very much clay gets into the material or whether it is necessary to shut down to clean the clay out. It was pointed out that the clay runs out with the solution and that the clay that is added, about 25 lbs. every 8 hours, is scrubbed out by the water wash.

Reasons for using pure oxygen instead of air were asked for by L. C. Burroughs, Shell Oil Co. This was explained by the presence of nitrogen in the air which must be separated later from the treated stock. Mr. Atkinson said he thought attempts to use air had been given up because it requires a much larger volume over the theoretical amount required to effect the reactivation. Also when excess air is used it entails some loss of vapor. He distinguished between U.O.P. copper sweetening of natural and the slurry-type treatment of cracked gasolines on this point.

E. J. Mary, Globe Oil and Refining Co., brought up the question whether there is any advantage in mercaptan removal between caustic wash and copper treating. It was pointed out that if the mercaptan is cut down to 10% of the original amount, only 10% as much oxygen is required.

M. W. Conn, Perco Inc., asked what strength caustic was used, referring to removal of natural inhibitors, what is the frequency of changing caustic, and whether the caustic washer is operated solely for removal of hydrogen sulfide or for some mercaptan removal. Mr. Atkinson said a 10 to 12 Baume caustic is used and guessed that is changed about once a week. He said it was operated for removal of H_2S and perhaps some phenolic compounds with no concerted attempt to remove mercaptan.

Mr. Conn doubted that inferior gum quality of the caustic washed gasoline could be attributed to removal of natural inhibitors by the caustic after a short period. He pointed out that Perco had operated a number of poly plant operations, and it had been their experience that after about 16 hours on a new charge of caustic, if the induction curve contact is plotted against time those characteristics are low with new caustic, but after a period of about 16 hours they level off back with the raw gasoline, which means that the new charging caustic will remove the natural inhibitors only for a short period.

A particular case was referred to where the gasoline was extremely sour, and using 20 Baume caustic that period of natural inhibitor removal by the caustic was only 8 hours. He said that is true of most gasolines, but in their pilot plant operation, what was called a preliminary run was made without caustic and with sulfide, for 16 to 20 hours to insure that those solutions were not removing any natural inhibitors.

Mr. Atkinson said he stood corrected to the extent that samples had been taken off before and after the caustic was showing violent difference in induction period.

Mr. Conn also questioned the items included in the treating cost of .0173 for pressure distillate, which were said to include labor, chemicals, inhibitors (DuPont 14 at 60c/lb. and the deactivator). Mr. Atkinson said it required something like 900 cu. ft. of oxygen ($12) per day for 1500 bbls., about 7-8 lbs. of cupric chloride at 16c per lb., 75 lbs. of clay at 1c per lb., and .0015% (4½ lbs.) of No. 14. About 1½ lbs. of deactivator ($2.50 per lb.) is used for a day's run. These figures should come out at 1.4c per bbl. for chemicals for treating 1500 bbls. of this particular stock.

Chairman R. T. Colquette, Root Petroleum Co., asked whether there is any kind of cracked gasoline made at the Shamrock plant to which this process would not be applicable. He asked also about the reported necessity for removing organic acids in connection with color loss. Mr. Atkinson said they had successfully treated all of their cracked gasoline. He admitted some color loss, but said organic acids are removed in the precaustic wash.

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Catalytic Treating Cuts TEL Expense

DATA indicating that in many instances it is uneconomical, from a manufacturing standpoint, to tolerate a total sulfur content of 0.1% in gasoline, were presented at the regional technical meeting of the Western Petroleum Refiners Association in Wichita, Oct. 4, by M. W. Conn, Perco Inc. Mr. Conn discussed the application of catalytic desulfurization showing particularly the relation between tetraethyl lead susceptibility and the presence of minute quantities of sulfur.

Of seven groups of combined sulfur compounds that occur in petroleum oils—mercaptans, alkyl sulfides, aromatic sulfides, disulfides, thiophanes, carbon disulfide, and thiophenes—catalytic desulfurization was said to decompose the first four readily. "Thiophanes and carbon disulfide are somewhat more difficult to decompose, while thiophenes, the least objectionable with respect to effect on TEL response and usually present to a greater extent in cracked and polymer gasolines than in straight-run gasolines, are not appreciably removed. . .

"Generally speaking, the normal sulfur removal by catalytic desulfurization is upwards of 85% for uncracked materials, while cracked and polymer gasolines yield total sulfur reductions of the order of 50%. Refinery vapor recovery gasolines and reformer stocks will ordinarily fall between cracked and uncracked gasolines in the per cent of total sulfur removable."

The Perco process design was said to be of simple and inexpensive construction. One such unit at Clendenin, W. Va., was described and illustrated in NATIONAL PETROLEUM NEWS, Oct. 2, 1940, p. R-354. Means for the removal of hydrogen sulfide from the desulfurized product will depend largely upon the economics of local conditions, Mr. Conn said. Straight caustic washing, water washing, or a combination of the two, or stabilization followed by the caustic wash was said to be generally the most economical means.

The materials of construction should be equal in quality to those used for a topping or primary distillation unit for high sulfur crudes. The catalyst chambers carry 4-6 tons of catalyst per 1000 bbls. daily capacity and are operated at 20-30 psi. Except for exchangers and cooler where liquid desulfurized materials are present, no special consideration should be given to the use of corrosion-resistant materials, Mr. Conn said.

For units processing straight-run or natural gasoline products that give catalyst life-cycles of 2500 to 5000 barrels throughput per ton, no regeneration and regenerating equipment were said to be required with catalyst at $35 per ton, f.o.b. mines. Stocks such as cracked and polymer gasolines, however, give short catalyst life-cycles, making regeneration equipment necessary. Catalyst regeneration is accomplished by burning out the catalyst in an atmosphere of controlled oxygen content and can be done either in place or in a clay burner of conventional type. Catalyst masses have been regenerated 15 to 20 times with no apparent loss of activity or falling off in catalyst life cycle, Conn said. Preliminary data on plant scale operations were said to show less than 0.5% handling loss between raw and finished storage.

Although there is no appreciable change in the composition of the treated product other than the removal of

Results from Catalytic Desulfurization

	West Texas Straight-Run Gasoline		Straight-Run Naphtha		Cracked Gasoline			Thermal Polymer Gasoline		18-lb. Natural Gasoline	
						After					
	Before	After	Before	After	Before	First 24 hr.	Second 24 hr.	Before	After	Before	After
A.S.T.M. Octane No.	56.5	58.2	45.4	49.6	65.7	69.1	68.3	72.0	74.5	73.0	73.6
1 cc. TEL	63.6	69.1	52.0	59.8	70.0	75.8	73.9	75.9	80.1	75.8	82.7
2 cc. TEL	67.5	75.0	56.6	66.8	72.4	78.0	76.3	77.3	81.8	78.6	87.4
3 cc. TEL	70.0	78.0	59.8	70.5	74.5	79.8	78.4	78.1	82.8	....	....
Total Sulfur, %	0.140	0.008	0.323	0.053	0.140	0.076	0.087	0.373	0.064	0.295	0.0085
Total S Reduction, %	..	94.3	..	83.6	..	45.7	37.8	....	82.8	....	96.5
Mercaptan Sulfur, %	....	....	0.119	0.0015	0.062	0.003	0.008	....	....	....	....
Mercaptan S Reduction, %	..	..	..	99+	..	95.1	87.1	....	....	....	....
Reid Vapor Pressure	2.65	3.0	3.05	3.15	9.00	11.30	10.35	10.90	12.30	17.25	17.70
Gravity, °A.P.I.	54.8	55.1	49.6	50.0	55.8	56.5	56.2	64.1	64.5	84.2	84.2
Color, Saybolt	23	14	+15	−16	+10	−16	−16	....	....	21	20
Distillation, °F.											
First Drop	144	138	137	132	93	90	92	87	86	80	76
10% Evaporated	198	193	226	224	146	139	139	126	124	90	90
50% Evaporated	259	257	335	333	282	277	275	192	188	114	114
90% Evaporated	343	341	409	408	375	375	373	378	372	180	180
End Point	394	388	440	445	420	458	430	463	386	295	306

sulfur, the clear octane number was said to be increased frequently as much as three points or more. The chief advantage of catalyst desulfurization, however, was said to be that leaded octane numbers are increased as much as 10 or more points, depending upon the amount of sulfur removed.

To date there are two licensed plants in operation, one of which has been mentioned and the other, a smaller unit, is near El Paso, Texas. On the basis of the capacity operation of the 1000-bbl. plant at Clendenin, the operating costs to date, exclusive of indirect charges were given as follows:

Labor, 24 hrs. @ 71c	$17.04
Fuel, 50 M.C.F. @ 16c	8.00
Water (steam pump)	6.00
Caustic, 800 lbs. 50% @ 1c	8.00
Steam (gasoline pump)	6.00
Catalyst (4000 bbls./ton)	11.00
Total operating cost/day	$56.04

Inasmuch as the plant is operating close to the rated capacity these figures are approximately correct, Conn said, and calculate to 5.6c per bbl. Net TEL savings were computed at 18c per barrel or about $100 per operating day.

The accompanying table shows some of the results obtained by catalytic desulfurization.

* * *

DISCUSSION

In the discussion which followed presentation of the paper, L. W. Royer, Skelly Oil Co., questioned application of the process to butane and propane. While Mr. Conn had no data, he believed that it had been so applied since all it requires is that the product can be vaporized above the dew point. He referred to the West Virginia plant where 14-pound natural gasoline is treated with as good results as on other material. It was brought out that apparently the only thing that inhibits activity of the catalyst is the presence of liquids.

Operating conditions were said to be about the same and reference was made to experimentation with a flow of a type called "catalytic dehydrogenation". That type of operation takes place at around 1025° F. and it was said to be particularly significant that sulfur reduction on the same product after desulfurization, or after dehydrogenation, is about the same in either case.

Questioned with respect to catalyst regeneration, it was pointed out that present plants do not regenerate. Through-put per ton of catalyst has been as high as 4400 bbls. per ton, and under some circumstances might be higher. At $44 per ton the catalyst cost is calculated at 1.1 cent per barrel processed and therefore to build a regeneration plant for reclaiming catalyst costing as little as this would be uneconomical.

Chairman C. W. Berger, Globe Oil & Refining Co., pointed out that the gasolines under discussion were largely with sulfur contents a great deal higher than refiners in the Mid-Continent are used to. He asked, therefore, if cracked gasolines of 65 to 70 octane number, with sulfur contents of .007%, and straight-run gasolines of 50-55 octane number with .04% sulfur, can be desulfurized economically. "In other words, can we pay out in TEL on that relatively low sulfur percentage?"

"To make a long story short," Mr. Conn replied, "at 70 octane, probably no; at higher octanes, yes. If a gasoline contains residual sulfur to an extent that it degrades octane number, probably of the order of 1 cc. TEL per gallon, the payout will be reasonable depending on the size of the plant. To operate the first commercial plant it is costing 8 cents a bbl., and I am sure that if that plant was adjacent to the gasoline plant the operating costs and particularly the labor costs would be substantially reduced. I can say that a 3000-bbl. plant or a 5000-bbl. plant may finally get the operating cost down to 6 or 7 cents and the construction cost at such a plant may be, with some further improvements, $50,000 to $60,000. Each case will depend on TEL susceptibility."

In answer to the question by F. S. Horne, Bareco Oil Co., whether doctor treating or copper treating or further sweetening can be eliminated when the catalytic process is used, Mr. Conn said it depends on conditions. In the plant in West Virginia, sweetening has been eliminated. In the plant out in Texas the mercaptan sulfur content runs as high as .008%. Product containing as much as .003% mercaptan sulfur content was considered sour and therefore, in the West Texas plant they charge directly into the plant Perco copper treater.

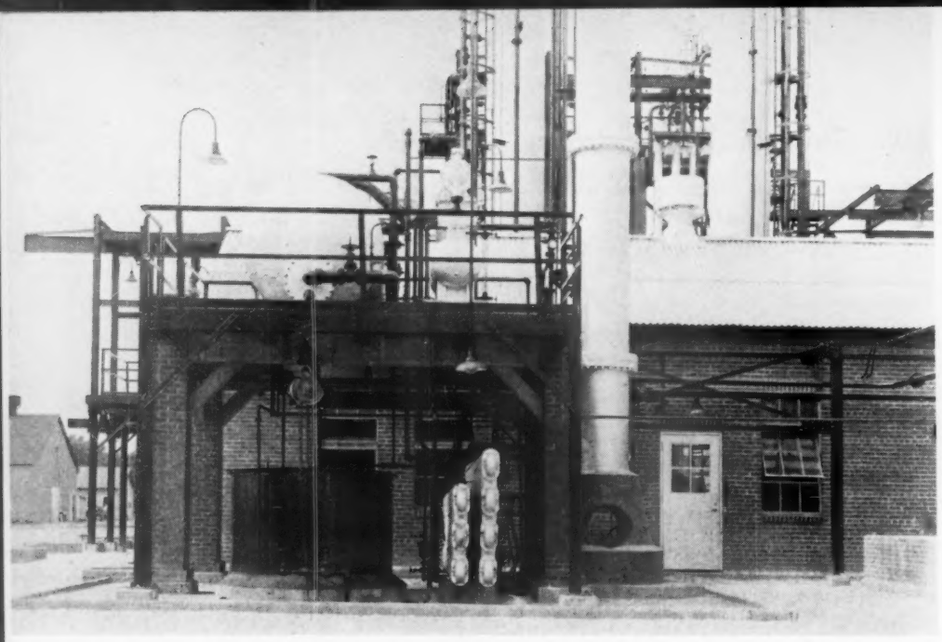
The question was then asked whether at the expense of more catalysts the additional reduction could be gained so as to produce a sweet product. Mr. Conn's reply was that "In that plant out there in Texas the product was sour after a couple or three days' operation. I should like to say it would be sweet all the way. Sweetening problems are not as severe as they were before desulfurizing by any means. The mercaptans are one of the easiest types of compounds to remove in this desulfurizing process."

Praeger Heads Alcorn Co.

Frank H. Praeger has been elected president and director of Alcorn Combustion Co. He has been associated with the company since 1928, first as sales engineer, then in charge of the company's branch offices in Tulsa, Los Angeles, and San Francisco. Since 1935 he has been sales manager.

Mr. Praeger is a native of San Antonio, Texas, and was graduated from the University of Pennsylvania in 1923. After graduation he worked for the Public Service Co. of N. J. He has published several papers on the design of petroleum heaters, the True Vapor Phase process, and has had a number of patents issued to him. He is a member of the American Petroleum Institute, Tau Beta Pi, honorary engineering fraternity, and Sigma Pi, social fraternity.

Roy S. Lyster, who is newly elected vice president and director, joined Alcorn in 1927 and became chief engineer in 1935. He was graduated from the University of Pennsylvania in 1919 and received his early engineering experience with Henry Disston & Sons Inc., Barrett Co., and Atlantic Refining Co.



An H_2S removal plant employing the Shell phosphate process. On the platform in front of the pump-house are the treating solution generator with condenser and separator mounted alongside. Beneath the platform are the solution mix tank and two banks of spine-tube heat exchangers. The absorber is on the right

Chemicalized Refining Processes Require Treatment of Charge

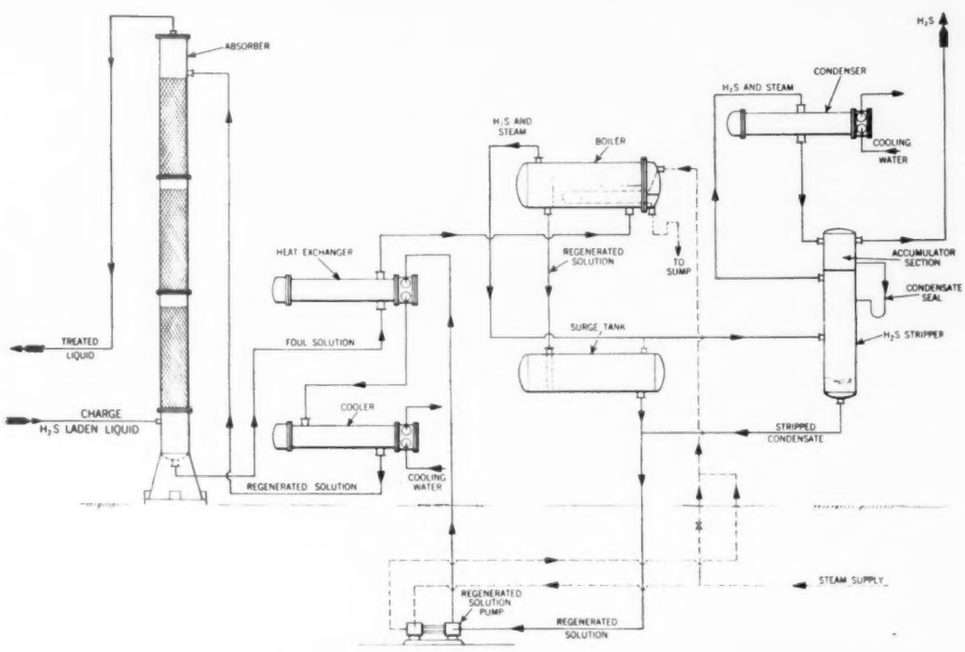
One of the most obnoxious charge stock impurities for the special processes such as polymerization, alkylation, or isomerization is hydrogen sulfide, according to Henry N. LaCroix, design engineer, Foster Wheeler Corp. This material reduces the net yield or effectiveness of product, poisons the catalyst, and forms undesirable sulfur compounds which are difficult to remove later.

One of the most economical methods for removing H_2S is said to be the phosphate process and one of the latest plants of this type to go into operation is illustrated herewith. This is a liquid extraction unit preparing liquid hydrocarbons for charging to a U.O.P. catalytic polymerization plant. It employs the Shell phosphate process, using aqueous solutions of tri-potassium phosphate, which is applicable to removal of H_2S from both liquids and gases. In either system the hydrocarbon is contacted countercurrently with the phosphate solution in towers, and the absorbing solution is continuously regenerated and recirculated through the process.

This plant was designed to operate on charge stock containing only 150 grains of H_2S per 100 cu. ft. of gas, with provision for handling greater quantities if necessary. Due to the small quantity of H_2S removed, no condensate stripper is needed. The phosphate salt may be prepared by chemical neutralization of the acid and alkali used, or it may be purchased in crystalline form, ready to be dissolved in water.

Operation to date has shown a reduction in H_2S content to as low as 7 grains per 100 cu. ft. It is recovered as a gas and burned in the boiler furnaces. Operation of the process is simple and costs for both initial installation and operation are relatively low, according to La Croix.

A number of H_2S removal plants using the phosphate process are operating on charge stocks for producing various high-octane blending fuels as, for example, polymerization units charging both gases and liquids, and alkylation units. The same purification process is also being used on natural gases and by a manufacturer of iso-propyl alcohol.



Flow diagram of a typical unit for removal of H_2S from liquids based on single, countercurrent flow of treating solution and hydrocarbon in an absorber filled with Raschig rings

Tetraethyl Lead Stabilized By Activated Glyceride

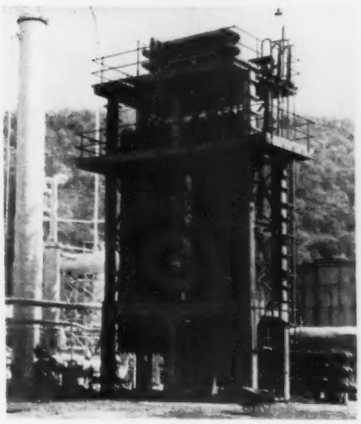
THE use of activated glycerides in stabilizing metallo-organic compounds such as tetraethyl lead and metallo-carbonyls, when used in motor fuel, was described by F. W. McCurry, Derby Oil Co., Wichita, following the presentation of a paper describing the similar use of lecithin at the recent annual meeting of the American Petroleum Institute. Both materials are obtainable from soy beans and the glyceride was discovered as the result of an effort to improve on lecithin, Mr. McCurry said, since the results as reported by the three Texas Co. men were in agreement with his experience except in being not so pronounced.

If lead is held in solution, both haze from sunlight and precipitation in blending and storage tanks may be eliminated, it was pointed out. The amount of activated glyceride necessary to stabilize motor fuel depends on the quality of the fuel, which may be governed by the type and amount of sulfur compounds present. Some fuels are stabilized with as small amount as one part in 200,000 parts of gasoline, while others require one part to 40,000 parts of gasoline, it was said.

The accompanying table shows the relative tendencies of two gasolines to haze in sunlight exposure when combined with various combinations of additives. The glyceride

These two samples of gasoline containing 3 cc. of tetraethyl lead were exposed to sunlight for 24 hours. The clear sample contained activated glyceride; the other did not. When tetraethyl fluid with and without the activated glyceride was stored for six months in the dark a pronounced difference in deposits was noted

AS REFINING TECHNOLOGY



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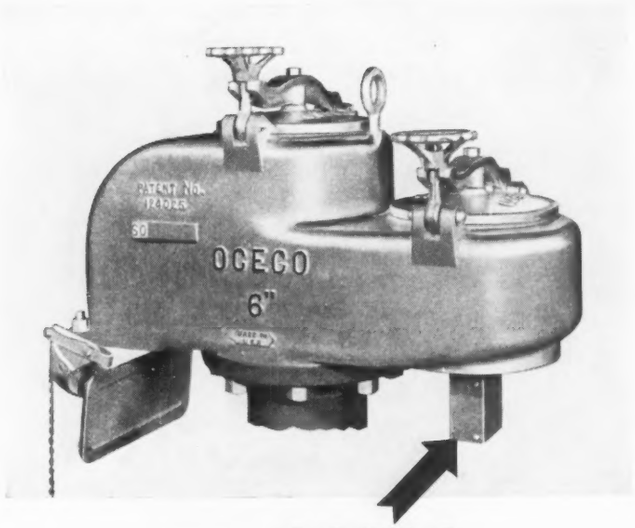

THE OCECO LOW-TEMP VALVE LIFT

provides protection against vent valves freezing

OCECO vent valves have always been exceptionally free from freeze-up troubles, even under the most unfavorable conditions,—and those of the newest design are more nearly freeze-proof than any that have heretofore been offered, either of our own or other manufacture.

It cannot be overlooked, however, that moisture-laden vapors precipitate their moisture as the temperature falls. This precipitated moisture is subject to freezing, with the possibility of fouling the valves, causing cave-ins. The Oceco low-temp valve lift, a simple device designed for attachment under the vacuum valve, provides dependable protection against this danger. As the temperature declines past 32° F., the "low-temp" raises the vacuum valve off its seat, permitting free tank breathing. As the temperature rises past 32° F., the valve is reseated—resuming normal operation. The action is sure, positive and automatic. There is nothing to get out of order.

Oceco low-temp valve lifts can be installed easily in the field without drilling any holes. Sizes are available for all models and sizes of Oceco vent units now in use, whether they are of stem-guided or cage-guided construction. Prices, and fully descriptive literature sent on request.

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was said also to preserve and stabilize the anti-knock value of motor fuels.

In addition to the stabilizing effect of gasoline and organic metallo-compounds, it was pointed out that the hazards of cleaning tanks may also be greatly decreased by preventing precipitation of metallic compounds. Another apparent need is where jobbers' tanks are changed seasonally from one commodity to another. Use of a stabilizing material will prevent scale and precipitate, thus contributing to safety.

Example of Stabilizing Petroleum Distillates and Motor Fuels

Sunlight Hours Exposed	1 Hour	2 Hours	4 Hours	8 Hours	24 Hours
1 Motor Fuel	Cloudy	Milky	Heavy Precipitate		
2 Motor Fuel and Glyceride	Cloudy	Milky	Heavy Precipitate		
3 Motor Fuel and 1 pt./40,000 Activated Glyceride	Clear	Clear	Clear	Clear	Heavy Precipitate
4 Motor Fuel and 1 pt./10,000 Activated Glyceride	Clear	Clear	Clear	Clear	Clear
5 Motor Fuel Cracked Distillate	Clear	Slightly Cloudy	Slightly Cloudy	Heavy Precipitate	
6 Motor Fuel Cracked and 1 pt./10,000 Activated Glyceride	Clear	Clear	Clear	Clear	
7 Motor Fuel and Tetraethyl Lead	Slightly Cloudy	Milky	Heavy Precipitate		
8 Motor Fuel and Tetraethyl and 1 pt./10,000 Activated Glyceride	Clear	Clear	Clear	Clear	Clear
9 Motor Fuel Cracked and Gum Inhibitor	Clear	Slightly Cloudy	Cloudy	Heavy Precipitate	
10 Motor Fuel Cracked and 1 pt./10,000 Activated Glyceride and Mono-Benzyl	Clear	Clear	Clear	Clear	Clear
and Para-Aminophenol	Clear	Clear	Clear	Clear	Clear
and Butyl-Para-Aminophenol	Clear	Clear	Clear	Clear	Clear
and Pyrogallol	Clear	Clear	Clear	Clear	Clear
and Alpha Naphthol	Clear	Clear	Clear	Clear	Clear
11 Motor Fuel and Iron Carbonyl	Milky	Dense	Heavy Precipitate		
12 Motor Fuel and Iron Carbonyl and Activated Glyceride	Clear	Clear	Clear	Clear	Clear

Edeleanu Solvent Plant Planned at Wood River

WOOD RIVER, Ill., Dec. 5.—Plans for construction of an Edeleanu solvent extraction plant of 1200 bbls. daily capacity here at the Shell Oil Co. refinery, are announced by R. C. Roberts, refinery manager. It is said to be the first plant ever to produce high solvency naphthas and odorless cleaning solvents successfully from Mid-Continent crude oils. The new plant will cost $550,000 and will go into operation early next summer, according to plans.

The new plant will be one of the largest and most complete in the U. S., it is said, and will assure paint manufacturers in the mid-west an uninterrupted supply of naphthas from a nearby source. The odorless naphthas are expected to stimulate a demand for new solvents among dry cleaning establishments in the mid-west. Odorless insecticide base will also be produced.

Gustav Egloff has been presented the Octave Chanute medal, awarded annually for the best paper on mechanical engineering read before the Western Society of Engineers. Motor fuels of the present and future was the subject of the paper.

Howard A. Acheson has acquired sole control of Acheson Colloids Corp., Port Huron, Mich. The reorganization is expected to permit better consolidation of engineering, manufacturing, and sales operations. Mr. Acheson, who has served as president and director of the company since 1929, is president, **G. R. Siegrist,** vice president and treasurer, and **J. P. Deringer,** vice president. Operation of technical laboratories at Newark remain under the direction of Raymond Szymanowitz.

OIL TRANSPORTATION

Ask ICC to Suspend New Southeast Rate

EL DORADO, Ark., Dec. 9.—Investigation and suspension of drastically reduced petroleum rail rates from South Atlantic and Gulf coastal origin points to Tennessee and Georgia destinations has been requested of the Interstate Commerce Commission.

Proposed rates, scheduled to go into effect Dec. 20, represent roughly reductions of about 40%, and seek to equalize rates from other Gulf coastal and South Atlantic points with those now existing from the New Orleans group into Tennessee and Georgia.

'Round-Trip Saving' Wanted on Turnpike

N. P. N. News Bureau

NEW YORK, Dec. 9.—Members of the Highway Transport Assn., Inc., have indicated that the Pennsylvania Turnpike "could be made more attractive to truck traffic" if trucks were offered a saving on the round-trip rate, similar to that offered to passenger cars, according to comment in the association's "Bulletin".

The association stated that reports of traffic over the Turnpike "confirms our conclusions that the Turnpike will not be attractive to heavy long-distance trucking," pointing out that only 1 in every 19 vehicles using the Turnpike during the first 3 weeks was a truck. Turnpike engineers had anticipated that 1 in approximately 4½ units would be a truck, "Bulletin" states.

Publicity head of the Pennsylvania Turnpike Commission has reported that a special agent was appointed by the Commission to contact the trucking industry and to discuss truck fare schedules. An official of the Transport Assn. said he "had no knowledge" of such an agent.

Meanwhile, the association stands pat on its resolution that its members would not attempt to use the Turnpike until the "weight limits in the state of Pennsylvania are brought into harmony with those of neighboring states, and until a toll has been established for large trucks which will permit the economical use of the Turnpike by long-distance carriers of general freight."

ICC Calendar On Oil Trucking

HEARINGS

Charles A. Harper and **Verne E. Schwin**, doing business as Badger Basin Distributors, Great Falls, Montana (MC 94098, sub. 3) December 18, Great Falls, on application authorizing extension of contract carrier operations of petroleum and products in States of Montana, Wyoming, Idaho, and Utah over irregular routes..

Becker Transportation Co., Cambridge, Mass. (MC 50439, sub. 3) Dec. 19, Boston, on application to extend operation as common carrier of petroleum and petroleum products in bulk in States of Massachusetts and New Hampshire over specified routes.

DECISIONS

L. W. Hageman, Laurel, Mont. (MC 100483). Application for permit to operate as a contract carrier of petroleum and products between Laurel, Mont., and points within 1 mile of Laurel, and points within a described area in Montana, Washington, Oregon, Idaho, Utah, Wyoming, South Dakota, and North Dakota, over irregular routes, denied.

E. Brooke Hutlack, Philadelphia, Pa., (MC 80092). Issuance of a certificate approved, upon compliance by applicant with certain conditions, to operate as a contract carrier of petroleum products, liquid fuels, and commercial solvents, in tank trucks, from and to specified points and areas in Delaware, Maryland, New Jersey, New York, and Pennsylvania, over irregular routes.

Williams Transportation Co., East Providence, R. I. (MC 9888). Issuance of a certificate approved, upon compliance by applicant with certain conditions, to operate as a common carrier of petroleum products, in bulk, in tank trucks, from and to specified points in Rhode Island, Massachusetts, and Connecticut, over irregular routes.

Collins Transportation Co., Inc., Taunton, Mass. (MC 30117, sub. 3). Issuance of a certificate approved, upon compliance by applicant with certain conditions, to extend operations as a common carrier of liquid petroleum products, in bulk, in tank trucks, from certain designated points in Rhode Island to points in a described territory in Connecticut and Massachusetts, over irregular routes.

Saxton J. Hayes, North Grafton, Mass., (MC 100321). Issuance of a permit approved, upon compliance by applicant with certain conditions, to operate as a contract carrier of liquid petroleum products, in bulk, in tank trucks, from Providence, R. I., to designated points in eastern Massachusetts, over irregular routes.

Venue Plea in Pipeline Cases Is 'Novel', Judges to Go Slowly

By N.P.N. Staff Writer

PHILADELPHIA, Dec. 6.—Question of whether government's Elkins Act test cases were filed in wrong court against Great Lakes Pipe Line Co. and Phillips Petroleum Corp. presents a novel legal problem requiring study before a decision can be reached, a three-judge court indicated here today.

At conclusion of hearings on motions to dismiss for lack of venue (jurisdiction), Judge Thomas Biggs, presiding, granted defendants until Dec. 13 to file briefs on their contention that suits should have been filed in the Middle West or Mid-Continent where the two lines operate.

Government counsel had hoped that the three-judge court would rule today, denying motions would have required answers to be filed by Dec. 16. Mac Asbill, leader of government counsel, told the court that there had been 36 days "delay" in the case already, since the two companies had challenged venue instead of filing answers when due on Oct. 31. Suits were filed in federal district court at Wilmington, Del., (corporate domicile of defendents) on Sept. 30.

Suit Attacks 'Dividend'

In these two suits, and in a third case filed at Hammond, Ind., involving Stanolind Pipe Line Co., the government contends that payment of dividends by pipeline companies to their owner-shippers constitutes an illegal rebate of transportation charges under the Elkins Act. The Act provides for assessment of penalties against the shippers in amount equivalent to three times the illegal rebate, going back as far as six years. No penalties were asked in the Great Lakes suit and government counsel decline to say whether or not they would file suit to collect penalties—if they win.

Government counsel, seeking an early trial of the Great Lakes and Phillips cases, had filed expediting certificates in these two cases. This automatically took cases from Wilmington, Del., district court to a statutory three-judge court from which appeal can be taken direct to U. S. supreme court. Should government win these cases, similar suits may be filed against 50 or 60 other pipelines. Total penalties, possible of assessment in all pipeline cases, amount to around 2 billion dollars.

No Similar Suits in Past

While failing to give any clue as to when the court might be expected to reach a decision, Judge Biggs observed there were no past suits under the Elkins Act which would be of much help in reaching the decision and that his court was faced with a problem of determining what Congress intended when it enacted the Elkins statute back in 1903.

R. L. Foster, counsel for Phillips Petroleum Co. and Phillips Pipe Line Co., told the court Congress had so worded the Elkins Act as to require the filing of the suit in one of the mid-western states through which its pipeline system passes.

Dan Moody, Great Lakes Pipe Line Company counsel, supported Mr. Foster's argument, tracing history of transportation laws since 1887 and stated that Congress had endeavored to set up special venue requirements, which in the instant proceedings, indicate the Elkins Act does not permit the filing of the Phillips and Great Lakes suits in the Delaware federal district court.

Judge Jones Comments

Judge Charles Alvin Jones questioned whether Delaware was not the proper place to file the suits, because the dividends, which the government alleges are illegal rebates under the Elkins Act, were constructively declared, paid and received in

that state. Phillips and Great Lakes Companies are Delaware corporations.

Government Attorneys Douglas Weaver and Mac Asbill argued the Elkins Act contains no provisions, which would limit the attorney general's choice of courts in filing the pipeline suits to the Mid-West.

Judge Jones, during the hearing, described the Elkins Act as "badly drawn" and "illogical", while Judge William Clark at one point in Mr. Foster's argument questioned whether he was not urging a narrow construction of the Elkins venue provisions.

Court through its questioning indicated considerable interest in Mr. Moody's contentions that Congress during its 50 years of legislating on transportation had intended to limit the filing of cases to the locality where the alleged acts were committed, and that this provides a guide to interpreting what the national legislators meant when they drafted the Elkins Act.

Manufacturers' Group Studies Effect of Madison Oil Cases

N. P. N. News Bureau

NEW YORK, Dec. 9.—Recommendations for improvement of the anti-trust laws, including amendment of the substantive portion of the Sherman Act, "to counteract the effect of the decision in the so-called Madison Oil Cases," have been made by the National Assn. of Manufacturers' Committee on Relations of Government to Industry. Recommendations of this committee have been approved by the Resolutions Committee and will be submitted to the Congress of American Industry in New York, Dec. 11 to 13, inclusive.

'Important to All'

"The fundamental principles of law involved in this case (Madison) are of extreme importance to all industry and it is the opinion of the committee . . . . that the alleged effect of this decision effectively reverses the hithertofore established rule of interpretation to wit: that concerted action by the members of an industry to remove an injurious competitive practice or condition is not a violation of the Sherman Act, even though such action and the elimination of the condition or practice may have the effect of changing the price level," committee said, continuing, "The conclusion reached by the committee . . . . is that an amendment should be made to the Sherman Act in order to make the 'rule of reason' universally applicable."

Proposes Industrial Agreements

Committee also recommended enactment of a new statute under which industries could improve competitive conditions by agreement, and "obtain assurance as to the propriety of such agreements." Committee said it believes that within this limited field declaratory judgments would be helpful, pointing out that it does not propose a revival of the NIRA, but rather a "means whereby competitors acting voluntarily and without coercion upon non-participants may obtain a fairly prompt review of an agreement eliminating unfair practices and immunity from prosecution from acts done pursuant to such an agreement where found to be within the scope of the anti-trust laws."

That primary enforcement of the Sherman Act should be by civil and not by criminal proceedings, save in exceptional cases, was also recommended.

* * *

J. Howard Pew to Speak

NEW YORK, Dec. 9.—J. Howard Pew, president of Sun Oil Co., will speak Dec. 12 on "Preserving the Private Enterprise System."

Mr. Pew's speech, which begins at 2:00 P.M. Thursday, will be carried by the blue network of the National Broadcasting Co.

Liberalized Truck Laws Urged as Defense Features

N. P. N. News Bureau

NEW YORK, Dec. 9.—Liberalized truck regulations in some states for speeding up the national defense program have been urged by John Woodward, President of the Rhode Island Truck Owners Assn.

"The army already has experienced the adverse effects of severe weight restrictions in some state trucking laws," he said. "Movements of materials to Fort Knox, and of horses from Seattle, Wash. to Monterey, Calif., have been handicapped by truck limitations imposted by Kentucky and Oregon, respectively."

In the present emergency, the nation needs speedy, flexible, highway transportation, Mr. Woodward asserted.

Proposed Rate Suspended By ICC on Road Oil

N. P. N. News Bureau

WASHINGTON, Nov. 30.—Interstate Commerce Commission, at protest of Lion Oil Refining Co., has suspended until next June 28 proposed rate reduction from 28c to 25c per hundred weight on petroleum road oil, in carloads, from New Orleans-Baton Rouge, group, Gulfport, Miss., and Mobile, Ala., to various Kentucky and Tennessee destinations.

Reduced rates would affect destinations intermediate to Cairo and Metropolis, Ill., and would be the same as now in effect to those 2 points.

New Safety Rules Hearing Being Held To Regulate Packaged Oil Shipments

N. P. N. News Bureau

WASHINGTON, Dec. 9.—Commerce Department's Bureau of Marine Inspection this week is staging a five-day hearing on new safety rules which will complete its regulation over all packaged petroleum and products shipped by water.

New rules cover packaged petroleum products in accordance with the Bland (inflammable cargoes) Act approved by the President on Oct. 9, and leave unchanged the present Bureau of Marine Inspection regulations applying to bulk petroleum shipments in tankers.

Effective date of the new rules is April 9, 1941, when they supersede existing regulations promulgated by Interstate Commerce Commission, which has ordered its rules to remain in effect until the April date.

New rules, according to Marine Inspection Bureau, apply to all vessels in foreign and do-both American and foreign flags in any navigable waters subject to the jurisdiction of the U. S., except tankers, work boats, and pleasure vessels. To prevent confusion among shippers accustomed to present practices in shipping petroleum products, Commerce Department regulations follow those of the ICC regarding definitions, descriptive names, labeling, container specifications, packing and marking.

Further regulations are proposed to govern storage and applying to common, contract and private carriers. Regulations also are applicable to combustible liquids with a flash point between 80 and 115°F. when transported on passenger vessels.

Gulf Pipes Oil From Cushing

CLEVELAND, Dec. 9.—Gulf Oil Corp. has completed arrangements to move a large volume of crude oil from Oklahoma via pipeline to its refinery outside of Philadelphia.

Common carrier tariff covering a rate of 57c per bbl. on crude from Cushing, Okla., to Philadelphia, has been filed with the Interstate Commerce Commission, and will become effective Dec. 12.

Transfer of crude from the Mid-Continent to the eastern seaboard by pipeline, is a new movement for the Gulf company. Heretofore, it had been receiving its supplies of raw material by tanker from the Gulf Coast.

The 57c per bbl. pipeline rate compares with the last paid rate of 60c in "dirty" boats for heavy crude or fuel from the Gulf to north of Hatteras.

Nine pipelines will figure in the movement. They are: Ajax, National Transit, Oklahoma, Southeast, Southwest Penna, Eureka, Illinois and Tuscarora.

Acquire Control of Bareco

TULSA, Dec. 9.—Acquisition of majority interest in the common stock of the Bareco Oil Co. from Barnsdall Oil Co. by a group of associates headed by O. L. Cordell of Tulsa, president of the Bareco Company, was announced here last week.

Associates in the deal include Henry Oliver Rea, James C. Rea, George R. Hann and H. V. Blaxter of Pittsburgh and Edward B. Burling of Washington, D. C.

Messrs. Hann and Blaxter have been appointed to the directorship of the Bareco Company.

No changes in management or operation of the company's 3 refineries at Wichita, Corpus Christi and Barnsdall, Okla. are contemplated.

Interstate Line Exempted

WASHINGTON — Commerce Department's publication, "Domestic Commerce," carries following item:

"In the case of *State v. Shell Pipe Line Corp.* (reported in 139 S.W. 2d 510) the Supreme Court of the State of Missouri held that a foreign corporation, although licensed to do business in Missouri, was not subject to the payment of the Missouri franchise tax where the company was engaged exclusively in interstate commerce with respect to Missouri in the transportation of crude petroleum through the State in a continuous movement from other States to States other than Missouri."

'Gas' Sales Up 55% In Past 10 Years, Despite Small Population Increase

POPULATION increases or decreases in the past decade in this country have slight relation to gasoline consumption.

There were 131,409,891 persons living in the U. S. on April 1, the U. S. Census Bureau reported, 7% more than in 1930. In practically the same decade, 1929 through 1939, registrations of motor vehicles of all kinds increased from 26,500,000 to 30,615,000, a gain of nearly 16%. Domestic gasoline demand was stepped up in the same period, from 14,652,000,000 gals. to 22,665,000,000 gals., an increase of nearly 55%.

Mileage of surfaced roads in the U. S. this year is 1,328,000 miles, almost double the 693,500 miles of 1930, it is estimated by the Public Roads Administration at Washington.

Except for one district, the Rocky Mountain states, increases in motor fuel consumption were as large in states where there were very small gains in population, as in states showing the greatest gain in population.

The large increase in motor fuel consumption in this country, in the last decade, is in no way due to cars in general getting less gasoline mileage now than they did 10 years ago. Automotive authorities say that, while the cars are larger, the engineering has improved and today's motor fuels are higher in quality; so automobiles in general get as many miles to the gallon as in 1930, if not slightly more.

Trend in the oil companies' prices for motor fuel to the public has been downward through this past decade. Despite the fact that state and federal taxes have increased in various sections of the country, motorists pay from 1c to 4c a gal. less for their gasoline than they did 10 years ago, records of NATIONAL PETROLEUM NEWS show.

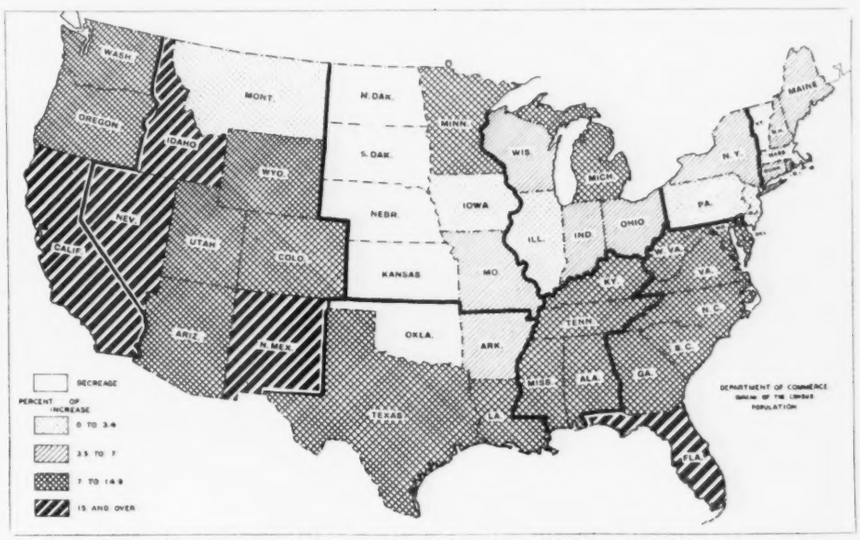
The largest declines in retail prices over a wide territory took place in New England and along the Atlantic Coast, where the oil companies used water transportation to bring motor fuel to the public at lower cost. What part, if any, this lower price has played in the large increase in gasoline consumption in this area, where gains in population have been small, can be only a speculation.

Comparison of the 1940 census figures by states and the latest data on motor vehicle registrations, domestic gasoline demand and miles of surfaced highway, with corresponding data for 10 years previous, (See accompanying table) brings out the factors which are more important than growth in population for determining the expansion of gasoline markets.

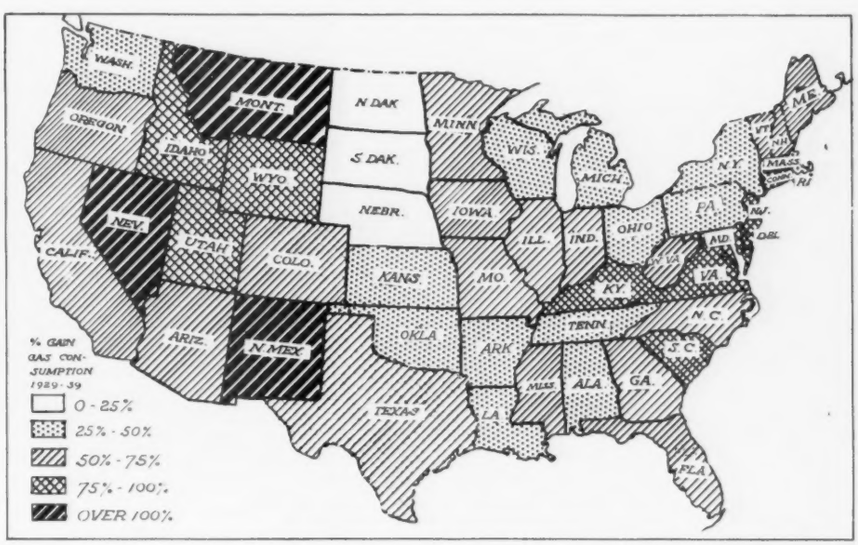
One of these factors is density of population, which serves to increase the use of motor vehicles, and also, because of traffic congestion cuts down the number of miles a vehicle runs on a gallon of motor fuel.

Studies conducted by the U. S. Bureau of Public Roads, in conjunction with some of the state highway departments, showed that the highest average annual mileage for passenger cars and trucks was 9780 miles. This was in towns of from 10,000 to 25,000 population. Mileage for vehicles registered in cities of from 25,000 to 100,000 was 9760 annually and in larger cities 9490 miles. On the other hand, the average annual mileage for all vehicles in the U. S. is 8870 miles, while in country sections, it is 7380 miles.

Vehicles registered in cities not only are driven more miles a year, which



How population in the states shifted from 1930 to 1940, by the official U. S. Census figures. The only actual decreases were in the states where farm lands were denuded by erosion and dust storms. Continental U. S. gained 7% in population in this decade, the total figure being 131,409,891 on April 1, 1940



How gasoline consumption gained in all states from 1929-39. Three states, Montana, Nevada and New Mexico, used more than twice as much gasoline in 1939 as ten years before

means more gasoline consumed, but a larger proportion of this driving is on city streets, where gasoline consumption is higher for the number of miles the car covers. In large cities, the roads bureau survey showed that 60% of the driving was on city streets; in smaller cities 40%; while in very small communities and in the country only 5% of the annual driving was on city streets. Opinion varies as to the increase in the amount of gasoline used in city driving; but many drivers, whose cars average 18 to 19 miles a gallon on country roads, say they average only 13 in city driving.

This increase in the annual mileage for motor vehicles registered in cities, is caused, at least in part, by the movement of families from city homes into suburban districts, or out into the country. While this movement has taken place all over the country, its tide has been strongest in the more densely populated districts in the eastern states, where large increases in motor fuel consumption have taken place in the past decade, although the gain in population was only 2 or 3%.

Suburban communities and townships near cities in these towns have doubled their population in many cases, during the past decade. In many eastern cities, there were actual losses in population in the 1930-40 decade; but the nearby counties showed larger proportional gains than the entire state, indicating the extent to which people were moving into the country.

This has led to more travel of family cars, and the extension of commercial trucking and operation of buses to serve these communities.

Another reason for the large increases in gasoline consumption in the densely settled districts lies in the fact that it is in these sections that most of the new highways are to be found, where faster driving is possible, and this increases the distance motor vehicles can travel in a day. On these roads, a day's motor trip of 500 to 600 miles is comfortably possible, with larger consumption of gasoline for the trip, while 250 or 300 miles a day may be all the average traveler can stand on the older highways. The scope of trucking operations is greatly enlarged on these new highways.

Motor vehicles' rate of consumption of gasoline is higher on the new highways because of the higher rate of driving speed. In passenger cars, oil companies' tests have shown consumption is 20% greater driving at 50 miles an hour than at 20 miles.

In the densely settled districts also, more care is given to keeping the highways open throughout the year, which leads to more winter driving.

Study of the census figures on population and gasoline consumption in some of the western states, over the past decade, indicates that increases in per capita income stimulate the use of gasoline in 2 ways. In districts where incomes increase at a greater rate than in other places, people living there have more money to spend and also people move in from other places. Some of the mining states, where per capita income has made the greatest recovery from the low point of the depression years of the early '30s, have increased in population and more than doubled their consumption of gasoline from 10 years ago.

Following is a comparison of gains and losses in population, motor vehicle registrations, gasoline consumption and miles of surfaced highway, for various geographical sections of the country. Details of changes by states are shown in the accompanying table.

New England

While there were not many more people living in the 6 New England states in 1940 than in 1930, they were far better customers of oil companies for motor oil and gasoline. To every 1000 people living in these states at present, there are 229.13 motor vehicles, which consume 179,700 gals. of gasoline a year. Ten years before, to every 1000 people in this district, there were 204.03 cars, which consumed 118,676 gals. of gasoline. Thus, eliminating the factor of increase in population, the

Ten Years' Story of Gasoline Demand, by States

As Related to Population Changes, Car Registrations and Miles of Surfaced Highways

State	Population 1940	Population 1930	% Change	Motor Vehicle Registrations 1939	Motor Vehicle Registrations 1929	% Change	Gasoline Consumption (Gallons) 1939	Gasoline Consumption (Gallons) 1929	% Change	Surfaced Roads (Miles) 1938	Surfaced Roads (Miles) 1928	% Change	Net Motor Fuel Demand Per Car 1929-34 (Gals.)
New England													
Conn.	1,710,112	1,606,903	+ 6.4	460,870	328,063	+40.48	352,525,000	202,355,000	+74.21	6,477	3,450	+ 87.74	709
Maine	845,139	797,423	+ 6.0	200,867	184,506	+ 8.87	150,137,000	95,858,000	+56.62	9,843	5,293	+ 85.96	609
Mass.	4,312,332	4,249,614	+ 1.5	871,936	817,704	+ 6.63	721,115,000	487,941,000	+47.79	19,147	8,783	+118.00	683
N. Hampshire	489,716	465,293	+ 5.2	131,302	108,880	+20.59	92,578,000	59,898,000	+54.56	8,073	2,546	+217.09	598
Rhode Island	711,669	687,497	+ 3.5	175,068	134,009	+30.64	129,878,000	79,102,000	+64.19	1,242	990	+ 25.45	701
Vermont	357,598	359,611	— 0.6	90,713	93,030	— 2.49	68,018,000	43,992,000	+54.61	6,905	4,857	+ 42.17	568
Total New England	8,426,566	8,166,341		1,930,756	1,666,212		1,514,251,000	969,146,000		51,687	25,919		Av. 645
% Change 1940 from 1930			+ 3.19%			+15.88%			+56.25%			+ 99.42%	
To 1000 people in 1940 there were:			229.13 cars,				179,700 gals. gasoline consumed,			6.13 miles of surfaced roads.			
To 1000 people in 1930 there were:			204.03 cars,				118,676 gals. gasoline consumed,			3.17 miles of surfaced roads.			
% Gain in 1940			12.3%			51.5%							
North Atlantic													
Delaware	264,603	238,380	+11.0	67,992	54,960	+23.71	58,428,000	32,576,000	+79.36	1,921	1,094	+ 75.59	700
Maryland	1,811,546	1,631,526	+11.0	425,064	319,873	+32.89	291,666,000	157,429,000	+85.27	9,659	5,493	+ 75.84	582
New Jersey	4,148,562	4,041,334	+ 2.7	1,027,747	832,332	+23.48	872,656,000	497,718,000	+75.33	11,593	8,734	+ 32.73	760
New York	13,379,622	12,588,066	+ 6.3	2,655,733	2,263,259	+17.34	1,900,716,000	1,283,500,000	+48.09	46,292	31,113	+ 48.79	649
Penna.	9,891,709	9,631,350	+ 2.7	2,054,787	1,733,283	+18.55	1,482,428,000	1,047,914,000	+41.46	44,318	24,901	+ 77.98	599
D. C.	663,153	486,869	+36.2	164,673	151,450	+ 8.73	149,978,000	71,827,000	+108.80	.....	.....	.....	...
Total North Atlantic	30,159,195	28,590,525		6,395,996	5,355,157		4,755,872,000	3,090,964,000		113,783	71,335		Av. 658
% Change 1940 from 1930			+ 5.49%			+19.44%			+53.86%			+ 59.51%	
To 1000 people in 1940 there were:			212.07 cars,				161,008 gals. gasoline consumed,			3.77 miles of surfaced roads.			
To 1000 people in 1930 there were:			187.31 cars,				108,111 gals. gasoline consumed,			2.50 miles of surfaced roads.			
% Gain in 1940			14.2%			49.2%							
Southern													
Virginia	2,664,847	2,421,851	+10.0	460,416	387,205	+18.90	382,097,000	208,304,000	+83.43	29,819	11,897	+150.64	626
Kentucky	2,839,927	2,614,589	+ 8.6	437,188	332,848	+31.35	274,901,000	154,656,000	+77.75	26,666	16,130	+ 65.32	531
Tennessee	2,910,992	2,616,556	+11.3	423,956	362,431	+16.98	288,737,000	195,036,000	+48.04	41,879	13,538	+209.34	593
N. Carolina	3,563,174	3,170,276	+12.4	573,497	483,602	+18.59	429,606,000	265,112,000	+62.05	31,935	28,345	+ 12.67	595
S. Carolina	1,905,815	1,738,765	+ 9.6	314,628	231,274	+36.04	212,325,000	118,596,000	+79.03	13,979	16,648	— 16.06	592
Georgia	3,119,953	2,908,506	+ 7.3	469,440	358,905	+30.80	358,292,000	219,266,000	+63.41	30,138	13,972	+115.70	653
Florida	1,877,791	1,468,211	+27.9	451,357	345,977	+30.46	365,830,000	224,153,000	+63.21	12,093	14,018	— 13.73	704
Mississippi	2,181,763	2,009,821	+ 8.6	244,086	250,011	— 2.37	209,493,000	138,157,000	+51.63	25,372	14,149	+ 79.32	641
Alabama	2,830,285	2,646,248	+ 7.0	325,472	285,533	+13.99	246,507,000	184,207,000	+33.82	33,215	17,370	+ 91.75	640
Louisiana	2,355,821	2,101,593	+12.1	340,091	280,868	+21.09	261,240,000	175,199,000	+49.11	16,830	10,731	+ 56.84	689
Total Southern	26,250,368	23,696,416		4,040,131	3,318,654		2,929,028,000	1,882,686,000		260,717	156,798		Av. 626
% Change 1940 from 1930			+10.78%			+21.74%			+55.58%			+ 66.28%	
To 1000 people in 1940 there were:			153.91 cars,				111,580 gals. gasoline consumed,			9.93 miles of surfaced roads.			
To 1000 people in 1930 there were:			140.05 cars,				79,450 gals. gasoline consumed,			6.62 miles of surfaced roads.			
% Gain in 1940			9%			40.4%							

(*Continued on page* 30)

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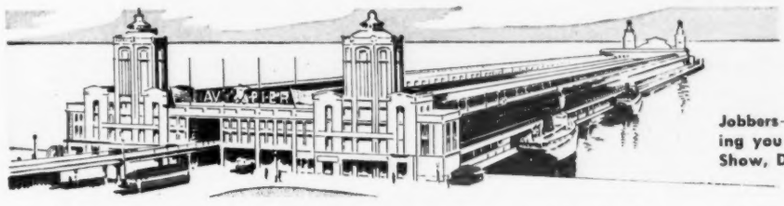

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Ten Years' Story of Gasoline Demand, by States (Continued)

State	Population 1940	Population 1930	% Change	Motor Vehicle Registrations 1939	Motor Vehicle Registrations 1929	% Change	Gasoline Consumption (Gallons) 1939	Gasoline Consumption (Gallons) 1929	% Change	Surfaced Roads (Miles) 1938	Surfaced Roads (Miles) 1928	% Change	Net Motor Fuel Demand Per Car 1929-34 (Gals.)
North Central													
W. Virginia	1,900,217	1,729,205	+ 9.9	286,167	268,888	+ 6.43	204,917,000	125,370,000	+63.45	11,722	3,917	+199.26	570
Ohio	6,889,623	6,646,697	+ 3.7	1,886,984	1,766,614	+ 6.81	1,371,266,000	955,328,000	+43.54	72,034	46,245	+ 55.77	566
Indiana	3,416,152	3,238,503	+ 5.5	960,842	866,715	+10.86	650,824,000	432,095,000	+50.62	53,793	50,995	+ 5.49	543
Illinois	7,874,155	7,630,654	+ 3.2	1,849,623	1,615,088	+14.52	1,419,723,000	845,000,000	+68.01	60,391	20,032	+201.47	536
Michigan	5,245,012	4,842,325	+ 8.3	1,472,311	1,395,102	+ 5.53	1,153,117,000	785,279,000	+46.84	58,435	24,167	+141.80	641
Wisconsin	3,125,881	2,939,006	+ 6.4	848,658	793,502	+ 6.95	566,724,000	403,396,000	+40.49	58,550	26,771	+118.71	568
Total North Central	28,451,040	27,026,370		7,304,585	6,705,909		5,366,571,000	3,546,468,000		314,925	172,127		Av. 571
% Change 1940 from 1930			+ 5.27%			+ 8.93%			+51.32%			+ 82.96%	
To 1000 people in 1940 there were:				256.74 cars,			188,625 gals. gasoline consumed,			11.07 miles of surfaced roads.			
To 1000 people in 1930 there were				248.12 cars,			131,223 gals. gasoline consumed,			6.37 miles of surfaced roads.			
% Gain in 1940			3.5%		43.7%								
Southwest													
Arkansas	1,948,268	1,854,482	+ 5.1	241,425	233,128	+ 3.56	181,921,000	134,606,000	+33.82	14,846	6,779	+119.00	671
Texas	6,418,321	5,824,715	+10.2	1,618,039	1,107,000	+46.16	1,340,893,000	769,608,000	+74.23	44,496	25,215	+ 76.47	621
Oklahoma	2,329,808	2,396,040	— 2.8	556,163	570,791	— 2.56	426,667,000	316,894,000	+34.64	15,287	3,711	+311.94	605
Total Southwest	10,696,397	10,075,237		2,415,627	1,910,919		1,949,481,000	1,221,108,000		74,629	35,705		Av. 632
% Change 1940 from 1930			+ 6.17%			+26.41%			+59.65%			+109.02%	
To 1000 people in 1940 there were:				225.84 cars,			182,256 gals. gasoline consumed,			6.98 miles of surfaced roads.			
To 1000 people in 1930 there were:				189.66 cars,			121,199 gals. gasoline consumed,			3.54 miles of surfaced roads.			
% Gain in 1940			19%		50.3%								
Middle West													
Kansas	1,799,137	1,880,999	— 4.4	574,472	581,223	— 1.16	476,833,000	361,165,000	+32.03	30,333	4,585	+561.57	704
Missouri	3,775,737	3,629,367	+ 4.0	877,094	756,680	+15.91	654,770,000	389,765,000	+67.99	37,575	12,319	+205.02	620
Iowa	2,535,430	2,470,939	+ 2.6	766,412	784,450	— 2.30	550,333,000	335,629,000	+63.97	43,924	15,191	+189.15	525
Minnesota	2,785,896	2,563,953	+ 8.7	840,050	730,399	+15.01	550,677,000	358,063,000	+53.79	55,292	34,223	+ 61.56	574
Nebraska	1,313,468	1,377,963	— 4.7	406,905	418,226	— 2.71	235,489,000	214,242,000	+ 9.92	18,506	4,651	+297.89	534
S. Dakota	641,134	692,849	— 7.5	189,485	204,199	— 7.21	133,292,000	123,265,000	+ 8.13	19,406	4,840	+300.95	652
N. Dakota	639,690	680,845	— 6.0	176,501	188,046	— 6.14	131,739,000	124,027,000	+ 6.22	17,200	2,953	+482.46	656
Total Middle West	13,490,492	13,296,915		3,830,919	3,663,223		2,733,133,000	1,906,156,000		222,236	78,762		Av. 609
% Change 1940 from 1930			+ 1.46%			+ 4.58%			+43.38%			+182.16%	
To 1000 people in 1940 there were:				283.97 cars,			202,597 gals. gasoline consumed,			16.47 miles of surfaced roads.			
To 1000 people in 1930 there were:				275.49 cars,			143,353 gals. gasoline consumed,			5.92 miles of surfaced roads.			
% Gain in 1940			3%		46.2%								
Mountain States													
Arizona	497,789	435,573	+14.3	131,355	109,013	+20.49	107,114,000	63,995,000	+67.38	4,762	3,421	+ 39.20	711
N. Mexico	528,687	423,317	+24.9	120,441	78,374	+53.67	101,946,000	48,458,000	+110.38	6,158	2,361	+160.82	633
Colorado	1,118,820	1,035,791	+ 8.0	343,487	303,489	+13.18	237,669,000	156,781,000	+51.59	12,876	6,952	+ 85.21	569
Utah	548,393	507,847	+ 8.0	132,871	112,661	+17.94	99,746,000	56,546,000	+76.40	6,538	3,996	+ 63.61	553
Wyoming	246,763	225,565	+ 9.4	82,884	60,680	+36.59	68,011,000	34,547,000	+96.87	4,068	1,604	+153.62	630
Nevada	110,014	91,058	+20.8	40,771	31,915	+27.75	43,880,000	17,813,000	+146.34	3,225	2,011	+ 60.37	693
Montana	554,136	537,606	+ 3.1	180,319	140,387	+28.44	126,521,000	57,514,000	+119.98	12,325	3,178	+287.82	607
Idaho	523,440	445,032	+17.6	153,226	118,074	+29.77	100,270,000	55,125,000	+81.90	9,724	8,487	+ 14.58	533
Total Mountain States	4,128,042	3,701,789		1,185,354	954,593		885,157,000	490,779,000		59,676	32,010		Av. 616
% Change 1940 from 1930			+11.51%			+24.17%			+80.36%			+ 86.43%	
To 1000 people in 1940 there were:				287.15 cars,			214,425 gals. gasoline consumed,			14.46 miles of surfaced roads.			
To 1000 people in 1930 there were:				257.87 cars,			132,579 gals. gasoline consumed,			8.65 miles of surfaced roads.			
% Gain in 1940			11.2%		61.7%								
Pacific Coast													
Oregon	1,087,717	953,786	+14.0	369,330	269,007	+37.29	244,677,000	152,091,000	+60.88	18,843	11,995	+ 57.09	622
Washington	1,721,376	1,563,396	+10.1	535,799	442,341	+21.13	349,454,000	253,168,000	+38.03	23,299	16,406	+ 42.02	592
California	6,873,688	5,677,251	+21.1	2,606,590	1,974,341	+32.02	1,837,912,000	1,139,736,000	+61.26	52,695	25,080	+110.11	666
Total Pacific Coast	9,682,781	8,194,433		3,511,719	2,685,689		2,432,043,000	1,544,995,000		94,837	53,475		Av. 627
% Change 1940 from 1930			+18.16%			+30.76%			+57.41%			+ 77.35%	
To 1000 people in 1940 there were:				362.68 cars,			251,172 gals. gasoline consumed,			9.79 miles of surfaced roads.			
To 1000 people in 1930 there were:				327.75 cars,			188,542 gals. gasoline consumed,			6.53 miles of surfaced roads.			
% Gain in 1940			10.6%		33.2%								

relative increase in gasoline consumption over the decade is 51.5% in this area and this is a larger proportional gain than for any other part of the country, except a few states in the Rocky Mountain area.

Vermont lost slightly in population, motor vehicle registrations dropped 2.49%, but gasoline consumption increased nearly 55% over the decade. Connecticut gained 6.4% in population, and the number of registrations increased over 40%, a rate of increase exceeded in only 2 other states. Gasoline consumption increased nearly 75%. Rate of increase in gasoline consumption was lowest in Massachusetts, 48%.

There were 6.13 miles of surfaced highway for every 1000 persons living in New England in 1940, more persons and more motor vehicle traffic per mile, than in most parts of the country. In addition, this territory enjoys a greater volume of tourist travel than most areas, which helps to swell its demand for motor fuel. Gasoline consumption here is at the rate of 645 gals. per year for each motor vehicle registered, as compared with 621 gals. average for the country.

Of its larger cities, Boston lost 1.5% in population over the decade; Cambridge and Bedford, both in Massachusetts, lost 2%; and Worcester lost 1%. Providence was practically unchanged.

New England had 6.6% of the country's population in 1940, and was using almost the same proportion of the annual gasoline consumption.

North Atlantic States

Conditions here were much like those in New England, for, despite a small increase in population, there was a large relative gain in gasoline consumption. Density of motor vehicles to surfaced highway is greater here than in any other section, with 56 motor vehicle registrations to each mile of surfaced highway.

District of Columbia, principally Washington, presents a striking example of the increased use of motor vehicles in congested areas. The District increased 36% in population, and 5 adjoining counties in Maryland and Virginia increased nearly 62%, due to increased numbers of government office workers under the New Deal. The number of motor vehicles registered in D. C. gained only 9% in the decade, but motor fuel consumipton more than doubled. Some of this consumption was by vehicles registered in adjoining

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states; but much of the driving was done in Washington.

Of cities in this area, New York gained 5% in population. Philadelphia lost nearly 1%, but 3 adjoining counties gained an average of 10%. Pittsburgh lost 0.7% and Allegheny county, surrounding it, gained 2.4%. Baltimore, which houses many government workers, gained 6.1%. The 3 New Jersey cities of Newark, Jersey City and Elizabeth lost an average of about 4% in population in the decade, and the entire state gained but 2.7%; but number of motor vehicle registrations gained over 23% and gasoline consumption gained 75%. Average consumption per year per motor vehicle registered for this state is 760 gals., highest of any state.

This section of the U. S. has about 23% of its total population, and used 21% of the 1939 gasoline consumption.

Southern States

These 10 states made a relatively large gain of 10.78% in population from 1930 to 1940, with only the Pacific Coast states showing larger gains. Car registrations gained about 22%, and gasoline consumption gained nearly 56%. This was about the same rate of gain as in the more densely populated portion of the country, where the gain in population was small.

In mileage of surfaced road, this district gained 66% in the decade, a small increase compared with most territories. It should be said here that a comparison of mileage of surfaced roads from 1928 to 1938, the latest year for which such figures are available, may be misleading because of changes in individual state's methods of reporting highway mileage, also because of differences in what the states report as surfaced highway. This may explain what appears to be a loss in surfaced highway in 1938, in Florida and South Carolina, as compared with previous 10 years.

Florida showed the largest gain in population of any state, nearly 28%. Motor vehicle registrations increased at a slightly higher rate and gasoline consumption by 63%. Virginia, Kentucky and South Carolina showed larger rates of gain in gasoline consumption over the decade than Florida. Mississippi showed a loss of 2.4% in car registrations and an increase in gasoline consumption of 34%.

Winter touring in Florida, Mississippi, Alabama and Louisiana raised the average demand per year for each motor vehicle registered in these 10 states to 626 gals. for the territory, against the country-wide average of 621 gals.

This district has 20% of the population of the U. S., and used 13% of the total gasoline consumption in 1939.

North Central District

Six north central states in the Great Lakes region increased in population only 5.27%, and in car registrations by about 9%; but their use of motor fuel gained 51% in the decade. An increase of 83% in surfaced roads helped bring this about.

In Ohio, many of the industrial cities lost in population in the decade; Cleveland by 2.4%, Cincinnati by 0.4%, Toledo by 3.3%, Akron by 4.7%, and Youngstown by 1.5%. In all cases, adjoining counties showed gains, indicating the movement of city families into suburban districts.

In Michigan, home of automobiles, increase in motor vehicle registrations in the decade was less than in population. Increase in gasoline consumption was 47%. Detroit gained 3.2% in population and some of its suburbs at a much larger rate.

In Illinois, population gained only 3.2% but motor vehicle registrations increased nearly 15% and gasoline consumption by 68%, the largest rate of gain of any state in this district. Surfaced highways nearly trebled in this state in the decade. Chicago was practically unchanged in population from 1930.

Annual motor fuel demand per motor vehicle registered in this district is 571 gals. Michigan is high, with 641 gals. These 6 states have nearly 22% of the country's population, consume nearly 24% of the gasoline used annually.

Southwest States

In the oil producing country, Texas made greatest strides, gaining over 10% in population in the 1930-40 decade, increasing in car registrations 46%, second largest in the entire country, only New Mexico being larger, and gaining by 75% in gasoline consumption. Its gain in miles of surfaced highway was not nearly commensurate with that in some other states. Houston gained 32% in population, Dallas 12%, Fort Worth 8.7%, and San Antonio 9.3%.

Oklahoma lost in population and car registrations—the effect of the migration from the dust bowl—and decreasing activity in its oil fields. Oklahoma City gained 10% in population; Tulsa was practically unchanged. Arkansas, with the largest gain in population of the 3 states and a 20% gain in motor vehicle registrations, had the smallest rate of increase in gasoline consumption of the 3 states, 34%. Its annual rate of consumption per vehicle in 1939 was highest of the 3 states, 671 gals., that of Oklahoma 605, Texas 621, exactly the national average.

This district has about 8% of the country's population and uses just about that proportion of the total annual gasoline consumption.

Middle West

This district of 7 states, from Missouri and Kansas north through Minnesota and the Dakotas, showed the smallest gain in population of any part of the country, 1.46%, Kansas, Nebraska and the Dakotas, which suffered from denuding of the soil in the dust storms, showed drops in population up to 7% and in motor vehicle registrations up to 6.14% for North Dakota. Rate of increase in registrations was 4.58% for the entire district. Though miles of surfaced highway increased by 182% for these states—the largest rate of gain for any district—the gain in gasoline consumption was 43.38%, smallest rate of gain for any district.

Missouri was an exception to the trend in this group of states. It gained 4% in population, nearly 16% in registrations, and "gas" consumption gained 68% in the decade, while miles of surfaced highway were nearly trebled. St. Louis lost 1% in population. Iowa gained slightly in population, lost 2.3% in registrations, but gained 64% in gasoline consumption.

Annual per car motor fuel demand averages 609 gals. for this district, ranging from 525 gals. for Iowa to 704 for Kansas. This territory has 10.2% of the U. S. population, and uses better than 12% of the annual gasoline consumption.

Mountain States

Eight states in the western mountain section showed the largest gain in population of any part of the country, except the Pacific Coast, due largely to the stimulus in mining and government water conservation projects. New Mexico gained 26%, second only to Florida, and motor vehicle registrations there increased 53%, largest of any state. There was only a moderate increase in the amount of surfaced highway, as compared with other districts; but gasoline consumption in these states increased 80% in the decade. Nevada gained 146%, Montana, 119% and New Mexico, 110%, the largest rate of increase in gasoline consumption of any states.

These 8 states have 3.1% of the population of the U. S., and use 4% of its annual gasoline consumption.

Pacific Coast

The 3 states on the far western side of the U. S. had the largest gain in population from 1930 to 1940 and largest gain in motor vehicle registrations; but the rate of gain in gasoline consumption was 57%, about the same as in several other districts.

To 1000 persons in this district, in 1940, there were 362.68 motor vehicles, which consumed 251,172 gals. of gasoline. This is the highest ratio of cars to persons in the country; it is double the number in the southern states. But in this same area in 1930, to every 1000 persons there were 327.7 cars, which used 188,542 gals. of motor fuel. Eliminating the effect of the increase in population, the rate of increase in gasoline usage was 32.2% in the decade, the smallest of any territory. Of the cities in these states, Los Angeles gained 21% in population in the decade; San Francisco lost 0.8%; Portland, Ore., gained nearly 2%; and Seattle showed a slight increase.

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'Alky-Gas' Expected to Get New Fling In Congress and State Legislatures

Proponents of power alcohol from farm crops may be expected to make strong drives this winter for legislation in Congress, and perhaps some farm states, to make mandatory the blending of alcohol with gasoline sold as motor fuel. Two new reasons why such measures should be enacted in current legislative sessions, will be advanced.

All important sponsors of power alcohol were returned to the 77th Congress in the November elections, including Representatives Knutson of Minnesota, Woodruff and Tenerowicz of Michigan and Harrington of Iowa; so agitation for a national power-alcohol law is expected to be at least as strong in the next Congress, as in the present one.

In Iowa, Kansas and Nebraska, the 3 states where use of alcohol as motor fuel is most vigorously championed, the elections did not change the situation. In Iowa, all previous sponsors in the legislature of power alcohol were re-elected and it is expected they will soon try to develop support for some sort of bill.

One new reason for bringing up "alky-gas" proposals this winter probably will be under the guise of a defense measure. Efforts have already been exerted, although unsuccessfully, to get the National Defense Advisory Commission to endorse some kind of power alcohol program as a defense measure.

Dr. William J. Hale, a chemist of Midland, Mich., speaking this fall before farmers and business men in Sioux City, Iowa, painted a dark picture of the country's safety, "unless there is a power alcohol plant in every county for our protection." Presumably he was talking of Iowa only.

Chemist Hale believed then that foreign enemies would enter this country from Mexico and wipe out the refineries along the Gulf Coast. "Oh, it's so easy, just a bomb, an explosion and in one night it's all over," he told his audience. He thought that next the invading army would destroy the gasoline stations in that part of the country, and he gave it only one day to accomplish this. Petroleum storage depots along the Gulf Coast he said would be taken care of when the refineries were blown up.

This proponent said that power alcohol plants in the farm states would also be a defense measure, in that, in addition to supplying motor fuel, they could also provide raw material for the manufacture of synthetic rubber. Stating that some oil companies were building plants which could make and sell raw rubber for 32c a pound, Chemist Hale said that rubber as a by-product from a power alcohol plant built primarily to make material to blend into motor fuel, could be made for as low as 7c a pound. He said this rubber could sell in New York for 10c a pound. "I have seen some of this rubber that has run a million miles," he told his Sioux City audience. "Certainly it is good for 100,000 miles."

The increasing crop surplus in this country and indications that the nation's problem of taking care of these surpluses will grow worse, will furnish another reason for the introduction of power alcohol legislation this winter, believes Arnold R. Daum, Chicago, executive secretary of the Committee on Motor Fuels of the American Petroleum Institute. In a talk before the North American Gasoline Tax Conference he said:

"Present crops will again be abnormally large, adding further to our huge surpluses, according to official estimates. Export markets for crops promise to decline still more, regardless of the outcome of the European conflict. If a cartel agreement is entered into with South America, as a hemisphere defense measure, it is likely to involve our absorbing their surplus crops, which are the only commodities they have to offer for export trade.

"Since power alcohol agitation normally ebbs and flows in almost direct relationship to the acuteness of the farm surplus problem, strong drives for all type of power alcohol programs can be expected to materialize during the coming year."

The type of alcohol-gasoline program least likely to receive consideration nationally, said Mr. Daum, is the proposal to make the use of 10% alcohol-gasoline compulsory, throughout the nation, by outright legislative decree or by assessing straight gasoline an extra tax which would be prohibitive, such as 10c a gallon.

The extreme nature and glaring economic faults of this type of program is generally recognized, he stated, not the least of which is the inability of agriculture to supply adequate raw materials from which to make such enormous quantities of alcohol as a nationwide 10% blend would require (something like 2.5 billion a year).

"A second type of program is more subtle and flexible, and better disguises the economic weaknesses," said Mr. Daum. "It asks Congress to subsidize the use of 10% blends by exempting them from the federal gasoline tax and thus to create a precedent encouraging states to grant similar exemptions from all or part of such state gasoline taxes."

Such proposals promise to be brought up again, said Mr. Daum, pointing out that a bill of this nature was defeated in the Senate last June by a vote of only 38 to 28. These proposals appeal more than the first type of program because they appear to be a voluntary program, he said, but their enactment into law would result in making the sale of alcohol-gasoline compulsory because of the prohibitive tax preferentials granted the product.

Enactment of such a measure, he told the state officials, would force e x t r e m e l y difficult administration problems upon every state, one phase of the entire subject which had been carefully avoided by proponents of the use of power alcohol as motor fuel.

"Virtually all problems of tax administration with alcohol blends lead back to one central fact; namely, that alcohol from farm products is 5 to 10 times more expensive than gasoline," he told the state gasoline tax officials.

"Even alcohol made from corn priced as cheaply as 50c per bushel costs 31c per gal. f. o. b. distillery, ex profit, according to careful studies by the Department of Agriculture. (See accompanying table on Page 36.)

"On the other hand, gasoline for years has been priced at about 5c a gal. and less, f. o. b. refinery. Admixing 1/10 gal. of 31c alcohol with 9/10 gal. of 5c gasoline, obviously would boost the cost of motor fuel 2.6c per gal. It also costs at least 0.5c more per gal. to distribute blends, due to the increased number of expensive short and cross hauls necessary to bring alcohol and gasoline together, additional storage facilities needed to handle the alcohol and extra time and labor consumed in blending.

"The gross extra cost of 10% alcohol blends thus would be at least 3.1c per gal. However, alcohol does improve anti-knock rating of gasoline, so that deduction from this gross cost should be made for the cost of achieving identical anti-knock improvement by means of addition of tetraethyl lead. Making this allowance, the net increased cost of 10% alcohol blends

over gasoline of equal anti-knock rating is 3c per gal."

This wide difference between costs of alcohol and gasoline would create the largest profit premium on dishonest practices, and the most avenues for pursuing them undetected, that have ever existed in the oil industry, said Mr. Daum. Substitution of lower-priced gasoline for the expensive alcohol could be made to yield illegal profits up to 3c a gal. Even substitution of alcohol made from other raw materials, than the local farm crops, could produce illegal profits up to 2c a gal., he stated.

If the use of alcohol blends were brought about by granting them tax exemptions sufficient to absorb their higher cost, the situation would be still more difficult to administer, he said. In addition to illegal profits from substituting cheaper materials for the expensive alcohol required in motor fuel, unscrupulous marketers could receive handsome profits from tax exemptions illegally obtained, defrauding the state and federal government of tax revenues.

Armies of inspectors would be required, he said, to make frequent checks of every retail motor fuel outlet, to establish that the fuels in the pumps contained the required percentage of alcohol, "enormously expanding the cost of tax administration to a point of dubious practicability."

If states passed laws compelling the use of alcohol made from farm products in the individual state, or exempting such blends from all or part of the state gasoline taxes, verifying the source of alcohol raw materials would be another expensive task for the authorities in that state.

Additional expense to oil companies and cost to the states in administering the laws requiring the use of alcohol blends, would come about through the fact that blending would have to be done at bulk plants. Blending at refineries and alcohol plants would be prohibitive because of the unnecessary cross hauls of either gasoline or alcohol. Opportunities for tax evasion and for illegal dilution of alcohol contents with gasoline or with alcohol from other sources, would be increased greatly because of the large number of blending plants required.

To supply sufficient alcohol for a 10% gasoline blend, the extent to which crops—except corn—would have to be increased to supply the raw materials for the nation's motor fuel supply, is shown below. These figures are from the U. S. Department of Agriculture Bulletin 327, Motor Fuels from Farm Products.

Corn is the only farm crop produced in excess of such requirements, on the basis of U. S. gasoline demand in 1935.

Even if the entire 1935 production of the 10 principal carbohydrate crops listed, were converted into alcohol, the total of 8,131,650,500 gals. of alcohol would be equivalent to 47.4% of the gasoline used in that year but it would have left the nation without

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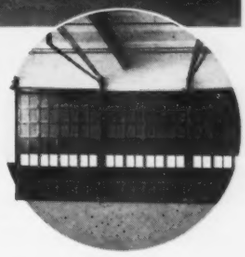

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food. The total alcohol obtainable from farm crops in 1935 would be 35% of gasoline used in 1939.

"Considering that, as a rule, perhaps only 10 to 15% of any crop would constitute a surplus over normal requirements, even in good years, some idea can be gained as to the inadequacy of present crops for the production of motor-fuel alcohol in very great amounts," the bulletin said.

Farm Crops Required for 10% Blend with Motor Fuel

Raw material	Alcohol obtainable from 1935 crop	Percentage of requirement for a national 10% blend obtainable from 1935 crop[2]	Percentage of 1935 crop required for a 10% blend[2]
	Gallons		
Barley	555,273,100	32.20	308.0
Corn	5,176,702,200	301.00	33.2
Grain sorghum[1]	136,908,000	8.41	1,205.0
Rice, rough	71,207,000	4.15	2,410.0
Rye	127,459,200	7.43	1,350.0
Wheat	1,568,317,400	91.60	109.3
Jerusalem-artichokes	. . .	. . .	. . .
Potatoes	249,484,200	14.50	687.0
Sweetpotatoes	69,853,000	4.07	2,455.0
Sugar beets	176,446,400	10.30	974.0

[1] Figures include only sorghum used for grain purposes. If entire crop were considered the production for 1935 would be 103,494,000 bushels.
[2] Assuming that the total amount would be produced from one crop.

Average cost of producing grain alcohol from corn—only farm crop now produced in volume to supply any appreciable amount of alcohol for blending with gasoline as motor fuel—is analyzed by the U. S. Dept. of Agriculture in its Bulletin, Motor Fuels from Farm Products.

Average cost, including profit and sales and distribution expense, is given as 38c a gal., from corn at 50c a bushel. The figure is for a plant producing 10,000 gals. of alcohol a day; in a plant producing 60,000 gals. a day, estimated cost is placed 4.2c per gal. less. General cost data is for 1938.

Cost of Making Alcohol from Corn

	Cents per Gal.
Conversion cost:	
Fuel (production basis of 10,000 gallons per day for 200-day year)	1.38
Water and power	.50
Labor	2.50
Interest	.85
Depreciation	.89
Taxes and general overhead	.88
Chemicals and supplies	.50
	[1]7.50
Raw material (corn at 50 cents a bushel; malt at $1 a bushel; 10 per cent malt basis. 2.3 gallons of 95 per cent alcohol produced per bushel of mixed grain)	24.40
	31.90
Byproduct credits for feed and fusel oil (feed at $22.50 gross per ton, making a net profit of $15. Fusel oil at 1 cent per gallon of alcohol[2])	5.10
Cost of bulk 95 per cent alcohol in tanks	26.80
Anhydrous step	2.0
Denaturing	2.0
Cost of anhydrous denatured alcohol at factory	30.80
Profit[3]	1.2
Sales and distribution[4]	6.0
Total cost	38.0

[1] This value would differ somewhat in various plants, but in any particular plant would remain comparatively constant. The other costs may fluctuate widely.
[2] In production of motor-fuel alcohol, fusel oil need not be separated unless sales returns justify the operation.
[3] Alcohol production usually yields a very small unit margin of profit.
[4] Depending on plant location.

Oil in Synthetic Rubber Is Vital Defense Factor

In order to create an artificial rubber-producing capacity to relieve this country from any need to use natural rubber, it has been estimated that an expenditure of $200,000,000 and a year's time to allow for construction, would be sufficient.

"In this way, petroleum will, more than ever before, be a potent factor in our national defense plans," says Dr. Gustav Egloff, Chicago, director of research for Universal Oil Products. It is expected that synthetic rubber production will be a notable contribution to national defense in 1941.

Consumption of natural rubber in the U. S. has been at a rate of about 600,000 tons a year; but the rearmament program is expected to increase annual demand by 100,000 tons or more. The amount of artificial rubber produced in this country in 1939 was only about 2500 tons. While the scheduled increase to an annual capacity of more than 20,000 tons, will represent a large expansion for the new industry, tentative plans are being shaped to raise the capacity to 100,000 tons annually by the end of 1942, which would be about one-sixth of normal requirements, it was estimated.

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October Tire Shipments Up 23% Over September

N. P. N. News Bureau

NEW YORK, Dec. 7.—October tire shipments exceeded September's shipments by 23.3%, according to Rubber Manufacturers Assn., Inc.

Tire shipments during October totaled 5,560,709 units, compared with 4,511,664 units shipped during September and 5,160,661 units in October, 1939.

An increase of 58.5% was reported for original shipments in October as against September, and 29.9% above October, 1939. Original equipment shipments amounted to 2,322,313 units in October compared with 1,464,925 units in September and 1,788,320 units in October, 1939, report said.

October replacement shipments of 3,098,371 units were 5.1% more than the September replacement shipments of 2,948,797 units but 4.0% below the October, 1939, replacement shipments of 3,226,305 units.

Exports of pneumatic casings were 140,025 which compares with 97,942 for September and 146,136 for October, 1939. Production, 5,081,939 units, was 15.1% above September and 5.7% under October, 1939.

Heating Oil Sales Up 18% in 1939

Domestic heating oil sales increased 18% in 1939, compared with previous year, according to a recent report from Bureau of Mines. This was attributed to additional cold weather and increased number of domestic oil burners installed.

With approximately 2,050,000 domestic oil burners in use at the end of 1939, the consumption of light distillate heating oils for this year exceeded 4 billion gals., report said.

New England, Middle Atlantic and North Central portions of the country were said to account for nearly 85% of the heating oil demand. Largest single consumer was New York state, with 21.7% of total demand; Illinois being second largest followed by Massachusetts, New Jersey and Pennsylvania. Range oil consumption was more concentrated with New England using 51% of total 1939 demand and Middle Atlantic states burning 28.7%.

Space heating of large building and factories took more than 1,600,000,000 gals. of heavy residual fuel, and operation of millions of small room heaters, range burners in cook stoves and water heaters consumed 1,500,000,000 gals. of range oil. Total consumption of all these petroleum products for heating totaled 7,278,306,000 gals., a quantity equivalent to one-third of all motor fuel consumed in U. S. last year. This compared with 6,385,260,000 gals. of heating fuels used in 1938, an increase of 14%.

Consumption of light heating oil substantially is proportional to the weather, report said. Other factors in the increase were attributed to better business conditions in 1939 and the continued low retail cost of fuel oil, which showed little change from 1938.

Tax Diversion Hit

More states ratified constitutional amendments to protect their road funds in 1940 than in any other single year. North Dakota adopted such an amendment June 25, while Idaho, Nevada, and South Dakota did likewise at the election Nov. 5. Previously the record year was 1938, when California, Michigan, and New Hampshire ratified similar amendments.

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Representation of Eagle, Ser. No. 433,182, Richfield Oil Corp., Los Angeles. Filed: June 19, 1940. For gasoline, lubricating oils, lubricating greases, stove fuel oil, fuel distillate, motor fuel oil, diesel oil, motor cleaning oils, asphalt oils, road oils, and naphtha. Published: Dec. 3, 1940.

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NPN INDEX OF HEATING OIL CONSUMPTION . . .

For Oil Companies Marketing Heating Oils to Check Their Gallonage against Consumers' Actual Requirements, as Figured from Temperature Deficiences Reported by U. S. Weather Bureau.

FOR NOVEMBER—

In the East, consumption was close to normal, some points a little less and some a little more. Atlantic Coast points uniformly had less than normal demand in November. Consumption in the East in November was less than in November, 1939, which was well above normal.

In central states, consumption at majority of points was above normal in November and much larger than in 1939.

In Pacific Coast territory, consumers' requirements were about 10% larger than normal, and greatly in excess of November, 1939, requirements, which were much less than normal.

(For data on November requirements at individual points as compared with normal and November a year ago, see Table 1.)

FOR HEATING OIL SEASON TO DEC. 1—

Throughout the East, consumption of fuel by oil burners has been above normal, by around 15% average.

It has also been moderately above last year's consumption up to this time, in this territory.

In central states, from Ohio and Michigan west, consumers' actual requirements have been less than a year ago. Consumption at most points has been less than normal, to a small extent.

In Pacific Coast territory, consumption has been 10 to 12% less than normal, for the season to date; but not quite as much below normal as last year to Dec. 1.

(For exact percentages by which consumption at individual cities exceeds, or falls below, normal requirements and for comparison with 1939 consumption see Table 2.)

For eastern territory in general, heating oil requirements in September and October were well above normal, and larger than in the same two months in 1939. Despite smaller requirements in November than last year, consumption for the season to date for practically all points is above normal.

Mid-western states in general had less than normal heating oil consumption in September and October; and a considerable increase in consumption in November, as compared with normal, has failed to bring consumption for the season to Dec. 1, up to normal.

Pacific Coast states' consumption in September and October was very light and, while consumption in November was 10 to 14% above normal, for the season to Dec. 1, this territory is further behind normal heating oil requirements than any other part of the country.

WHAT THE TABLES SHOW

The tables on this page are an index to the actual consumption of heating oil at 28 cities over the country, as calculated from outside-temperature deficiencies, by the U. S. Weather Bureau stations at these points.

Data shown is in Degree Days, which many oil marketing companies use to calculate the requirements of individual consumers. For complete explanation of how to use Degree Days, refer to NATIONAL PETROLEUM NEWS, Sept. 11, 1940, p. 25.

By use of the tables, companies marketing heating oil can check their own gallonage, at the individual points shown, or for the general territory in which they are located, against actual consumption in oil burners.

Table 1—November Heating Oil Requirements, in Degree Days

	Nov. Normal Degree Days	Actual Nov. 1940 DDs	% Above or Below Normal Needs Nov. '40	% Above or Below Normal Nov. '39	% Normal Season's Needs Used In Nov. '40	% Normal Season's Needs Used In Nov. '39	Total DDs In Normal Season
NEW ENGLAND							
Portland, Me.	780	819	+ 5	+ 7	12.0	12.3	6814
Burlington, Vt.	860	885	+ 3	+14	11.8	13.1	7486
Boston	690	663	— 4	+ 5	11.0	12.0	6022
Providence, R. I.	636	659	+ 4	+18	11.6	13.1	5689
Hartford, Conn.	686	712	+ 4	+11	11.8	12.6	6010
MIDDLE ATLANTIC							
New York City	624	602	— 4	+ 5	11.4	12.3	5290
Albany	739	807	+ 9	+21	12.4	13.7	6516
Rochester	780	781	0	+ 5	11.8	12.3	6620
Buffalo	770	774	0	+ 5	11.5	12.1	6723
Trenton, N. J.	619	618	0	+10	11.9	13.1	5190
Philadelphia	581	558	— 4	+ 3	11.6	12.5	4792
SOUTH ATLANTIC							
Baltimore	549	498	— 9	+ 3	10.8	11.5	4628
Washington	562	510	— 9	+ 2	11.0	12.4	4620
Richmond, Va.	502	467	— 7	+ 9	12.2	14.4	3820
CENTRAL							
Cleveland	721	695	— 4	— 4	11.3	11.3	6144
Chicago	742	792	+ 5	— 5	12.4	11.0	6378
Detroit	773	805	+ 4	+ 2	12.4	12.2	6454
Milwaukee	834	860	+ 3	—14	11.7	10.1	7117
Minneapolis	959	1115	+16	—15	14.1	10.4	7895
St. Louis	583	628	+ 8	0	13.5	12.6	4658
Des Moines, Ia.	766	882	+15	— 8	13.9	11.1	6329
Omaha	775	906	+17	— 9	14.5	11.3	6229
Kansas City	615	722	+17	+ 3	14.4	12.7	5006
Denver, Colo.	734	813	+11	—13	14.1	11.1	5742
PACIFIC COAST							
Seattle, Wash.	549	609	+11	—24	14.1	9.6	4317
Portland, Oreg.	546	621	+14	—17	12.2	10.4	4367
San Francisco	218	239	+10	—21	10.0	7.3	2382

Table 2—Season's Heating Oil Requirements to Dec. 1, in Degree Days

	Sept.-Nov. Normal Degree Days	Actual Sept.-Nov. 1940 DDs	% Above or Below Normal 1940	% Above or Below Normal 1939	% Normal Season's Needs Used In Sept.-Nov. '40	% Normal Season's Needs Used In Sept.-Nov. '39	% Normal Season's Requirements In Normal Sept.-Nov.
NEW ENGLAND							
Portland, Me.	1343	1520	+13	+10	22.3	21.7	19.7
Burlington, Vt.	1490	1735	+16	+18	23.2	23.5	19.9
Boston	1136	1335	+17	+ 3	22.2	19.4	18.9
Providence, R. I.	1070	1219	+14	+11	21.4	20.9	18.8
Hartford, Conn.	1156	1386	+19	+ 7	23.0	20.7	19.2
MIDDLE ATLANTIC							
New York City	906	1037	+14	+ 7	19.6	18.3	17.1
Albany	1256	1573	+25	+24	24.1	23.9	19.3
Rochester	1273	1468	+15	+ 6	22.2	30.3	19.2
Buffalo	1258	1405	+12	+ 8	20.9	20.1	18.7
Trenton, N. J.	929	1112	+20	+11	21.4	19.9	17.9
Philadelphia	808	946	+17	+ 9	19.8	18.4	16.8
SOUTH ATLANTIC							
Baltimore	830	843	+ 2	— 7	18.2	16.6	17.9
Washington	857	871	+ 2	— 2	18.8	18.2	18.6
Richmond, Va.	669	766	+14	+14	20.6	20.7	17.5
CENTRAL							
Cleveland	1122	1162	+ 3	— 4	18.9	17.4	18.2
Chicago	1199	1143	— 5	—11	17.9	16.9	18.8
Detroit	1218	1343	+10	+ 6	20.8	20.1	18.9
Milwaukee	1346	1292	— 4	—11	18.2	16.8	18.9
Minneapolis	1605	1578	— 2	— 6	19.9	19.1	20.3
St. Louis	853	752	—13	— 9	16.1	16.9	18.5
Des Moines, Ia.	1227	1138	— 7	— 9	17.9	17.6	19.4
Omaha	1210	1123	— 7	—11	18.0	17.3	19.4
Kansas City	920	866	— 6	— 6	17.3	17.2	18.3
Denver	1266	1168	— 8	—19	20.3	17.8	22.0
PACIFIC COAST							
Seattle, Wash.	1045	915	—12	—15	21.2	20.5	24.2
Portland, Oreg.	982	878	—11	—21	20.1	17.7	22.5
San Francisco	448	391	—12	—17	16.4	15.6	18.8

MARKETS

Mid-Western

CHICAGO, Dec. 7.—Movement of fuel oils continued good the past week, according to most sellers, with some reports indicating heavy fuels were "scarce" in the Chicago area.

No changes in quotations for refined products were reported by refiners or tank car marketers. Open spot sales of 72-74 oct. gasoline at 3.75c, 0.125c under last reported sale price, were reported by a tank car marketer. Group 3 quotations reported by marketers ranged from 3.75 to 3.875c, while Group 3 quotations reported by refiners ranged from 4.50 to 5c.

Total open spot sales during the week reported by three marketers were as follows: 11 cars of 72-74 oct., 5 cars at 3.75c, and 6 cars at 3.875c; 1 car of 63-66 oct. at 3.375c; 2 cars of 60 oct. and below at 3.125c; 5 cars of Ethyl, 2 cars at 4.25c, 2 cars at 4.50c, and 1 car at 4.625c; 5 cars of range oil, 3 cars at 3.625c, and 2 cars at 3.75c; 1 car of No. 1 p. w. fuel at 3.625c; and 4 cars of No. 2 fuel at 3.125c, FOB Group 3.

Atlantic Coast

NEW YORK, Dec. 7.—Several Atlantic Coast suppliers reported advancing their quotations for gasoline and light and heavy fuel oils at many points along the seaboard the week ended Dec. 7.

Gasoline was quoted 0.5c higher at New York with low quotations for 72-74, 68-70 and 65-66 oct. grades, at 5.50c in tank cars, 5.25c in barges. Low quotations for 72-74 oct. were up 0.3c to 6.10c at Albany, 6.20c at Portland and Providence; 68-70 oct. up 0.3c to 6.20c at Portland, according to suppliers' reports.

Quotations reported for Nos. 2 and 3 fuel oils were up 0.2c at New York, to 4.70c in tank cars, 4.60c in barges. Two suppliers said they had advanced their prices for kerosine 0.4c at Albany, and for both kerosine and No. 2 fuel 0.4c at Portland, Boston and Providence. Kerosine quotations were at 5.70c at Portland, 5.60c at Albany, Boston and Providence; quotations for No. 2 fuel, 5.10c at Portland and 5c at Boston and Providence. A Philadelphia supplier reported advancing his quotations for Nos. 2 and 3 fuel oils to 4.75c, effecting 0.25c advance on low of price range. No. 2 was up 0.25c to 4.50c at Wilmington when several suppliers reported 0.25c advances in their prices.

Marine diesel oil, ships' bunkers, was up 10c at many points when several suppliers reported advancing their prices. Quotations at New York were at $1.95 per bbl.

Pennsylvania

CLEVELAND, Dec. 7. — Kerosine was quoted 0.125c higher in the upper western Penna. field the past week, with reports from both upper and lower fields indicating heavy demand for light fuels. Inter-refinery activity in lubes continued brisk at "much firmer" prices, according to reports. Prices to jobbers and compounders were reported unchanged. Neutrals were said to be "scarce."

Quotations reported by upper field refiners for 45 w.w. kerosine ranged from 5.25 to 5.375c, and one refiner reported quoting 5.50c for 46 w.w., up 0.125c from the previous week.

Some reports indicated competition for export wax business was keen. One refiner reported 0.125c reduction to 2.875c, New York, in his quotations for 122-124 and 124-126 A.m.p. crude scale. Wax quotations reported by other refiners ranged upwards from 2.85c.

Mid-Continent

TULSA, Dec. 7. — "Surprisingly heavy" gasoline demand against contracts reported by two Oklahoma refiners, reflecting increased employment due to national defense preparations, highlighted Mid-Continent markets the past week. A third Oklahoma refiner said he had turned down "outside" orders for Ethyl and 72-74 oct.

At the same time, three refiners, one in Kansas and two in Oklahoma, said they had encountered "cheap gasoline competition" in Texas, Iowa, Nebraska, Louisiana and Minnesota. No changes in quotations or open spot sales were reported.

Burning oils continued in heavy demand, refiners said. Kerosine, long a "slow mover," was moving "good," according to reports. An Oklahoma refiner reported withdrawing his quotation for No. 1 p. w. and said he had turned down inquiries for from 50 to 100 cars.

Sales prices and quotations reported for Grade 26-70 natural gasoline remained unchanged from previous week at 2.25c, FOB Group 3, and 2c, FOB Breckenridge.

Gulf

NEW YORK, Dec. 7.—Kerosine and No. 2 fuel were offered 0.125c lower at the Gulf the past week, according to reports here and from the southwest. Asking prices for other refined products were reported unchanged. "High" tanker rates were said to be hampering movement of all products.

Asking prices reported for kerosine ranged from 3.625 to 4c off 0.125c on the low with indications that several cargoes were available at 3.625c. No. 2 fuel was offered 0.125c lower, with refiners asking prices ranging from 3.125 to 3.75c. One refiner reported asking 3.25c, three, 3.375c, one 3.625c, and one, 3.75c for No. 2.

No open spot cargo sales were reported. Trading in heavy fuels also was virtually at a standstill, according to reports. Refiners' asking prices reported for Bunker "C" fuel ranged from $0.80 to 0.90 per bbl. in ships' bunkers, $0.80 to 0.85 in cargo lots.

California

LOS ANGELES, Dec. 7.—Further advances in all grades of fuel oil, averaging about 5c per bbl., were reported by independent suppliers in the Los Angeles Basin. These increases, which were reported for limited quantities, brought the range of 10 gravity, 200 viscosity oil, with 3% sulphur content, to $0.55 to $0.65 per bbl. and of 17 gravity, 125 viscosity oil, with 1.5% sulphur, to $0.65 to $0.75. Quotations on these oils at independent plants in the San Joaquin Valley were said to be fractionally lower than in the Basin.

Union Oil Co. and other California suppliers announced, effective Dec. 4, increases of 50c to $1.50 per ton in their prices of various grades of road oil and paving asphalt.

No increase was reported in quotations for fuel oil for export, which remained at $0.65 to $0.75 per bbl. for Grade C fuel oil for ships' bunkers at independent plants with terminal facilities at the Las Angeles harbor.

In the domestic market, quotations on third grade gasoline at independent Basin plants were reported generally unchanged.

REFINERY and SEABOARD PRICES

In bulk lots by Motor Transport, Tank Car, Barge or Tanker as shown

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

HOW PRICES ARE REPORTED—

Refinery and Seaboard prices in National Petroleum News are gathered by PLATT'S OILGRAM and are as published in the Monday issue of the OILGRAM.

PLATT'S OILGRAM is a reporting service issued in three identical editions daily from News Bureaus at New York, Cleveland, and Tulsa, Okla. PLATT'S OILGRAM gathers and publishes what its publisher and representatives believe to be accurate news of sales, prices and current happenings affecting the oil industry and that will be of interest to its subscribers. As this information is usually private, OILGRAM reports it according to what it is able to obtain from sources deemed reliable.

All information is supplied without guarantee as to its completeness, accuracy time of transmission or promptness of delivery.

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Publisher reserves the right to change the extent, nature and form of showing this information at any time.

Prices shown in the tables are quotations (meaning sellers' general offers or posted prices), or actual sales prices, reported to OILGRAM by refiners for "open spot" transactions, except as otherwise specified.

Prices arrived at by discounts off a specified price or "market date of shipment," prices named in contracts or prices arrived at in accordance with any arrangement made prior to date of sale, are not for "open spot" transactions and therefore are not considered in making the price tables. Prices made to brokers and prices in "inter-refinery" transactions are also not considered except as may be noted.

All prices are for "immediate" shipment except in Gulf Coast bulk transactions where shipment is generally to be made in ninety days. Prices are FOB refineries, pipelines, or tanker terminals in districts designated.

Prices shown are for quantities in bulk such as tank car lots, motor transport lots or barge lots; and in cents per gallon; heavy fuel oils are in dollars per barrel of 42 U.S. gallons; wax and petrolatums are in cents per pound. Prices applying to barges or cargoes only are so designated.

Prices do not include taxes or inspection fees. Prices are published at the close of the business day.

Mid-Western prices in the tables were gathered from refiners with offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Other refinery prices are given by and for the particular refining district where the material is made and from which it is shipped.

When prices obtained by OILGRAM do not conform to these conditions the exception and the new conditions are noted in the news lead or in conjunction with the price table by footnote or otherwise, for the particular refinery or sales district involved.

Crude oil and products covered by OILGRAM'S news and price service, except where noted, have been represented to the publisher as fully up to the customary trade specifications indicated and according to the generally accepted methods of test; and all crude oil and all products thereof as having been lawfully produced and transported.

Any apparent error should be reported to the nearest OILGRAM or National Petroleum News office at once as no correction will be made after the second issue of the OILGRAM or National Petroleum News following its publication.

Summary of Daily Gasoline Prices (Dec. 3 to Dec. 9)

U. S. Motor, (ASTM octane	Latest Prices Mon. Dec. 9	Dec. 6	Dec. 5	Dec. 4	Dec. 3
72-74 octane:					
Oklahoma	(u) 4.50 –5.00	(u) 4.50 –5.00	(u) 4.50 –5.00	(u) 4.50 –5.00	(u) 4.50 –5.00
Mid-Western (Group 3 basis)	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.50 – 5.25	4.50 – 5.25	4.50 – 5.25	4.50 – 5.25	4.50 – 5.25
W. Tex. (For shpt. to Tex. & N.M. dest'ns.)	5.00 (2)	5.00 (2)	5.00 (2)	5.00 (2)	5.00 (2)
63-66 octane:					
Oklahoma	4.125– 4.50	4.125– 4.50	4.125– 4.50	4.125– 4.50	4.125– 4.50
Mid-Western (Group 3 basis)	4.125– 4.50	4.125– 4.50	4.125– 4.50	4.125– 4.50	4.125– 4.50
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.125– 5.00	4.125– 5.00	4.125– 5.00	4.125– 5.00	4.125– 5.00
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.50 (2)	4.50 (2)	4.50 (2)	4.50 (2)	4.50 (2)
60 octane & below:					
Oklahoma	3.75 – 4.25	3.75 – 4.25	3.75 – 4.25	3.75 – 4.25	3.75 – 4.25
Mid-Western (Group 3 basis)	3.75 – 4.125	3.75 – 4.125	3.75 – 4.125	3.75 – 4.125	3.75 – 4.125
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	3.75 – 4.50	3.75 – 4.50	3.75 – 4.50	3.75 – 4.50	3.75 – 4.50
W. Tex. (For shpt. to Tex. & N. M. dest ns.)	4.00 (2)	4.00 (2)	4.00(2)	4.00(2)	4.00 (2)
Motor Gasoline, 72-74 octane (ASTM):					
New York harbor	5.50 – 6.20	5.50 – 6.20	5.50 – 6.20	5.25 – 6.20	5.25 – 6.50
Philadelphia district	5.50 – 7.09	5.25 – 7.00	5.25 – 7.00	5.25 – 7.00	5.25 – 7.00
Baltimore district	5.50 – 6.75	5.50 – 6.75	5.50 – 6.75	5.50 – 6.75	5.50 – 6.75
Motor Gasoline:					
74-76 Octane: (L-3)					
Bradford-Warren (Western Penna.)	6.00	6.00	6.00	6.00	6.00
Other Districts (Western Penna.)	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00
72-73 Octane: (L-3)					
Bradford-Warren (Western Penna.)	5.75 (1)	5.75 (1)	5.75 (1)	5.75 (1)	5.75 (1)
Other Districts (Western Penna.)	----	----	----	----	----

REFINERY PRICES

Gasoline U. S. Motor (ASTM Octane) except where otherwise specified

Prices Effective	Dec. 9	Dec. 2
OKLAHOMA		
72-74 oct.	(u) 4.50 –5.00	(u) 4.50 –5.00
63-66 oct.	4.125– 4.50	4.125– 4.50
60 oct. & below	3.75 – 4.25	3.75 – 4.25
60-62 400 e.p.	4.00 (2)	4.00 (2)
MID-WESTERN		
72-74 oct.	4.50 – 5.00	4.50 – 5.00
63-66 oct.	4.125– 4.50	4.125– 4.50
60 oct. & below	3.75 – 4.125	3.75 – 4.125
N. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
72-74 oct.	4.50 – 5.25	4.50 – 5.25
63-66 oct.	4.125– 5.00	4.125– 5.00
60 oct. & below	3.75 – 4.50	3.75 – 4.50
60-62, 400 e.p.	4.25–4.75 (2)	4.25–4.75 (2)
W. TEX. (For shpt. Tex. & N. M. dest'ns.		
72-74 oct.	5.00 (2)	5.00 (2)
63-66 oct.	4.50 (2)	4.50 (2)
60 oct. & below	4.00 (2)	4.00 (2)
CENT. W. TEX. (Prices to truck transports)		
80 oct. & above	6.00 (1)	6.00 (1)
72-74 oct.	4.625 (1)	4.625 (1)
67-69 oct.	3.875 (1)	3.875 (1)
62 oct. & below	3.50 (1)	3.50 (1)
KANSAS (For Kansas destinations only)		
72-74 oct.	4.625– 4.875	4.625–4.875
63-66 oct.	4.25 – 4.75	4.25 –4.75
60 oct. & below	3.875–4.125	3.875–4.125

Prices Effective	Dec. 9	Dec. 2
ARK. (FOB Ark. plant of one refiner, for shipment to Ark. & La.)		
72-74 oct.	4.625	4.625
70-72 oct.	4.50	4.50
60 oct. & below	4.125	4.125
WESTERN PENNA. (Motor gasoline.		
Bradford-Warren:		
74-76 oct. (L-3)	6.00	6.00
72-73 oct. (L-3)	5.75 (1)	5.75 (1)
Other districts:		
74-76 oct. (L-3)	5.75 – 6.00	5.75 – 6.00
72-73 oct. (L-3)	----	----
Naphtha		
Untreated naphtha	5.50 – 5.75	5.50 – 5.75
Stoddard Solvent	6.00 – 6.25	6.00 – 6.25
CENTRAL MICHIGAN (f)		
U.S. Motor: (Oct. L-3)		
72-74 oct.	6.25 – 6.75	6.25 – 6.75
67-69 oct.	5.50 – 6.25	5.50 – 6.25
Str.-Run Gasoline	(g) 4.25 –5.00	(g) 4.25–5.00
OHIO (S. O. Ohio quotations for statewide delivery and subject to exceptions for local price disturbances)		
72-74 oct.	7.125	7.125
CALIFORNIA U.S. Motor:		
58-61 grav., 375-400 e.p., 65 oct. & above	5.50 – 6.50	5.50 – 6.50
54-58 grav., for outside state shipment	4.75 – 5.50	5.00 – 6.00
54-58 grav., for instate shipment	4.50 – 5.00	4.50 – 5.00

Kerosine, Gas & Fuel Oils

Prices Effective	Dec. 9	Dec. 2
OKLAHOMA		
41-43 grav. w.w.	3.875– 4.00	3.875– 4.00
42-44 grav., w.w.	4.00 – 4.125	4.00 – 4.125
Range Oil	3.75	3.75
No. 1 P.W.	3.625– 3.875	3.625– 3.875
No. 1 straw	3.50–3.625 (2)	3.50–3.625 (2)
No. 2 straw	3.375– 3.625	3.375– 3.625
No. 2 dark	3.375 (1)	3.375 (1)
U.G.I. gas oil	3.25 (2)	3.25 (2)
No. 3 fuel	3.375–3.50 (2)	3.375–3.50 (2)
No. 6 fuel	$0.60 (1)	$0.55–$0.60 (2)
14-16 fuel	$0.85 (2)	$0.85 (2)
MID-WESTERN		
41-43 grav. w.w.	3.875– 4.00	3.875– 4.00
42-44 grav. w.w.	4.00 – 4.125	4.00 – 4.125
Range Oil	3.75 (2)	3.75 (2)
No. 1 p.w.	3.50 – 3.875	3.50 – 3.75
No. 1 straw	----	----
No. 2 straw	3.375– 3.625	3.375– 3.625
No. 3	3.25 – 3.50	3.25 – 3.50
No. 5	$0.75–$0.85 (2)	$0.75 (1)
No. 6	$0.55–$0.60 (2	$0.50–$0.60 (2)
N. TEX. (For shpt. to Tex. & N. M dest'ns.		
41-43 grav. w.w.	3.75 – 4.75	3.75 – 4.75
No. 1 P.W.	3.75 (2)	3.75 (2)
KANSAS (For Kansas destinations only)		
41-43 grav. w.w.	4.125 (1)	4.125(1)
42-44 gravity w.w.	4.125– 4.375	4.125– 4.375
No. 1 p.w.	3.75 – 4.00	3.75 – 3.875
No. 6 fuel	$0.625-$0.65(2)	$0.625-$0.65 (2)

(f) Prices FOB Central Michigan refinery group basis for shipment within Michigan; shipments may originate at plants outside Central group. (g) Excluding Detroit shipment. (h) For shipment to Ark. points only. (u) One refiner reports quoting "4 to 4.50c" for 72-74 oct., the lower price applying only to shipment into restricted competitive areas.

REFINERY PRICES (Continued)

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

Kerosine, Gas & Fuel Oil

Continued

Prices Effective	Dec. 9	Dec. 2
ARK. (F.o.b. Ark. plant of one refiner for shipment to Ark. and La.)		
41-43 grav. w.w.	4.25	4.25
No. 1	3.75	3.75
No. 2	3.625	3.625
28-32 zero fuel	3.50	3.50
Tractor Fuel	(h)4.25	(h)4.25
WESTERN PENNA.		
Bradford-Warren:		
45 grav. w.w.	5.25 – 5.375	5.125– 5.375
46 grav. w.w.	5.50 (1)	5.50 (1)
No. 1 fuel	4.875– 5.375	5.00 – 5.25
No. 2 "	4.75 – 5.375	5.00 – 5.125
No. 3 "	4.75 – 5.00	4.875–5.125 (2)
36-40 gravity	5.00	5.00 – 5.25
Other districts:		
45 grav. w.w.	5.00 – 5.125	5.00 – 5.125
46 grav. w.w.	5.00 – 5.25	5.00 – 5.25
47 grav. w.w.	5.125– 5.375	5.125– 5.375
No. 1 fuel	4.625– 4.75	4.625– 4.75
No. 2 "	4.50 – 4.75	4.50 – 4.875
No. 3 "	4.50 – 4.625	4.50 – 5.00
36-40 gravity (l)	4.25–4.375 (1)	4.25–5.00
CENTRAL MICHIGAN (f)		
47-49 gravity w.w.	5.00 – 5.30	5.00 – 5.25
P.W. Distillate	5.00 – 5.25	5.00
No. 3 gas oil, Str.	4.50 – 4.75	4.50 – 4.75
U.G.I. gas oil	3.75 – 4.00	3.75 – 4.00
Fuel Oils (Vis. at 100):		
500-700 Vis.	....	....
300-500 Vis.	2.75 (1)	2.75 (1)
100-300 Vis.	....	....
OHIO (S. O. Ohio quotations for statewide delivery)		
Kerosine	5.625	5.375
CALIFORNIA		
40-43 grav. w.w.	4.50 – 6.00	4.50 – 6.00
San Joaquin Valley:		
Heavy fuel	$0.55 –$0.65	$0.50 –$0.55
Light fuel	$0.65 –$0.70	$0.60 –$0.70
Diesel fuel	2.75 – 4.00	2.75 – 4.00
Stove dist.	2.75 – 5.00	2.75 – 5.00
Los Angeles:		
Heavy fuel	$0.55 –$0.65	$0.50 –$0.55
Light fuel	$0.65 –$0.75	$0.60 –$0.70
Diesel fuel	2.75 – 4.00	2.75 – 4.00
Stove dist.	2.75 – 4.00	2.75 – 4.00
San Francisco:		
Heavy fuel	$0.80	$0.80
Light fuel	$0.90	$0.90
Diesel fuel	4.50	4.50
Stove dist.	5.50	5.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Lubricating Oils

WESTERN PENNA.

Prices are given by Penna. refiners as their quotations to jobbing and compounding trade only. Prices to other refiners generally are lower.

Viscous Neutrals — No. 3 col. Vis. at 70° F.

200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	....	....
10 p.t.	....	....
15 p.t.	....	....
25 p.t.	21.00 –22.00	21.00 –22.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	....	....
10 p.t.	....	....
15 p.t.	....	....
25 p.t.	19.00 –20.00	19.00
Cylinder Stocks		
Brt. stk., 145-155 vis. at 210°, 540-550 fl., No. 8 col.		
10 p.t.	....	....
15 p.t.	....	....
25 p.t.	12.00 –14.00	12.00 –14.00
600 S.R. filterable	7.00 – 8.00	7.00 – 8.00
650 S.R.	8.00 – 9.00	8.00 – 9.00
600 fl.	9.00 – 9.50	9.00 – 9.50
630 fl.	11.00 –11.50	11.00 –11.50

MID-CONTINENT (F.o.b. Tulsa)

Neutral Oils (Vis. at 100° F. 0 to 10 P.P.)
Pale Oils:

Vis.	Color		
60-85	No. 2	5.25 – 5.75	5.25 – 5.75
86-110	No. 2	5.25 – 6.25	5.25 – 6.25
150	No. 3	8.00 –10.25	8.00 –10.25
180	No. 3	8.50 –10.50	8.50 –10.50
200	No. 3	8.50 –11.00	8.50 –11.00
250	No. 3	10.00 –12.00	10.00 –12.00
280	No. 3	10.50 –13.75	10.50 –13.75
300	No. 3	11.50 –14.25	11.50 –14.25

Lubricating Oils (Cont'd)

Prices Effective	Dec. 9	Dec. 2
Red Oils:		
180—No. 5	8.50–9.00 (2)	8.50–9.00 (2)
200—No. 5	8.50–10.00 (2)	8.50–10.00 (2)
280—No. 5	11.50–12.00 (2)	11.50–12.00 (2)
300—No. 5	11.00 –12.00	11.00 –12.00

Note: Viscous Neutrals, 15-25 p.p. generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils.

Bright Stock—Vis. at 210°

200 Vis. D	18.00 (1)	18.00(1)
150-160 Vis. D:		
0 to 10 p.p.	13.50 –16.00	13.50 –16.00
10 to 25 p.p.	13.00 –15.50	13.00 –15.50
25 to 40 p.p.	12.50–15.00 (2)	12.50–15.00 (2)
150-160 vis. E	12.50 –15.00	12.50 –15.00
120 Vis. D:		
0 to 10 p.p.	12.50 –15.25	12.50 –15.25
25 to 40 p.p.	14.375 (1)	14.375 (1)
600 S.R. Dark Green	7.00 (2)	7.00 (2)
600 S.R. Olive Green	8.00 – 9.50	8.00 – 9.50
631 S.R.	12.00 (1)	12.00 (1)
Black Oil	4.00–5.50 (2)	4.00–5.50 (2)

SOUTH TEXAS Neutral Oils

Vis.	Color		
Pale Oils: (*Vis. at 100°F*)			
100	No. 1½-2½	5.25 – 5.50	5.25 – 5.50
200	No. 2-3	7.25	7.25
300	No. 2-3	7.75	7.75
500	No. 2½-3½	8.50	8.50
750	No. 3-4	8.75	8.75
1200	No. 3-4	8.875	8.875
2000	No. 4	9.00	9.00
Red Oils:			
200	No. 5-6	7.25	7.25
300	No. 5-6	7.75	7.75
500	No. 5-6	8.50	8.50
750	No. 5-6	8.75	8.75
1200	No. 5-6	8.875	8.875
2000	No. 5-6	9.00	9.00

CHICAGO (From Mid-Continent p.l. crude

Neutra Oils (Vis. at 100° F. 0 to 10 p.p.)

Pale Oils

Vis.	Color		
60-85	No. 2	7.25	7.25
86-110	No. 2	7.25	7.25
150	No. 3	8.50	8.50
180	No. 3	9.50	9.50
200	No. 3	10.00	10.00
250	No. 3	11.00	11.00
Red Oils:			
180	No. 5	9.50	9.50
200	No. 5	9.50	9.50
250	No. 5	11.00	11.00
280	No. 5	12.00	12.00
300	No. 5	12.00	12.00

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower.

Unfiltered Steam Refined: (Viscosity at 210°)

140	8.75	8.75
160	9.50	9.50
200	10.50	10.50

Bright stocks, 160 vis. at 210, No. 8 color:

0 to 10 p.p.	15.00	15.00
15 to 25 p.p.	14.00	14.00
30 to 40 p.p.	13.50	13.50
E filtered Cyl. Stock	12.50	12.50

Note: To obtain prices delivered in Chicago add 0.25c per gal.

Natural Gasoline

(Group 3 & Breckenridge prices are to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

FOB GROUP 3			
Grade 26-70	(k)	2.25	(k) 2.25
FOB BRECKENRIDGE			
Grade 26-70	(k)	2.00	(i) 2.00

CALIFORNIA (FOB plants in Los Angeles basin)

75-85, 350-375 e.p. for blending	4.75 – 5.00	4.75 – 5.00

Naphtha and Solvent

Prices Effective	Dec. 9	Dec. 2
(FOB Group 3)		
Stoddard solvent	5.875	5.875
Cleaners' naphtha	6.375	6.375
V. M. & P. naphtha	6.375	6.375
Mineral spirits	5.375	5.375
Rubber solvent	6.375	6.37
Lacquer diluent	6.625– 7.375	6.625– 7.375
Benzol Diluent	7.875– 8.375	7.875– 8.375

OHIO (S. O. Ohio quotations for statewide delivery):

V.M.&P. naphtha, D.C. naphtha, Special Varnolene, Varnolene & Sohio solvent	8.75	8.75
Rubber solvent	8.25	8.25

Wax

White Crude Scale:

WESTERN PENNA. (Bbls., C.L., N. Y.)		
122-124 A.m.p.	2.85 – 2.875	2.85 – 3.00
124-126 A.m.p.	2.85 – 2.875	2.85 – 3.00
OKLAHOMA (Bbls. or burlap bags, C.L.)		
124-6 AMP.	3.00 (1)	3.00 (1)
131-3 AMP.	3.25 (1)	3.25 (1)

CHICAGO (FOB Chicago district refinery of one refiner, in bags or slabs loose, carloads. Melting points are EMP (ASTM) methods; add 3° F. to convert into AMP.)

Fully refined:		
122-124 (bags only)	5.60	5.60
125-127	5.60	5.60
127-129	5.85	5.85
130-132	6.15	6.15
132-134	6.40	6.40
135-137	7.15	7.15

Petrolatums

WESTERN PENNA. (Bbls., carloads; tank cars, 0.5c per lb. less.)

Snow White	5.125– 6.125	5.125– 6.125
Lily White	4.375– 5.125	4.375– 5.125
Cream White	3.375– 4.125	3.375– 4.125
Light Amber	2.625– 3.00	2.625– 3.00
Amber	2.375– 2.875	2.375– 2.875
Red	2.125– 2.625	2.125– 2.625

Group 3 Freight Rates

To Division Headquarters Points of Standard Oil Co. of Indiana

	Gasoline-Kerosine		Distillate-Gas Oil-Fuel Oil	
	Cents per Cwt.	Cents per gal. 6.6 lbs.	Cents per Cwt.	Cents per gal. 7.4 lbs.
Chicago, Ill.	40	2.640	32	2.368
Decatur, Ill.	39	2.574	31	2.294
Joliet, Ill	40	2.640	32	2.368
Peoria, Ill	39	2.574	31	2.294
Quincy, Ill.	36	2.376	29	2.146
Indianapolis, Ind.	48	3.168	39	2.886
Evansville, Ind.	46	3.036	37	2.738
South Bend, Ind.	49	3.234	**42	**3.108
Detroit, Mich.	64	4.224	51	3.774
Grand Rapids, Mich.	58.5	3.861	**50	**3.700
Saginaw, Mich	66	4.356	53	3.922
Green Bay, Wis.	51	3.366	41	3.034
Milwaukee, Wis.	43	2.838	34.5	2.553
LaCrosse, Wis	46	3.036	37	2.738
Minneapolis-St. Paul	46	3.036	37	2.738
Duluth, Minn.	52	3.432	41.5	3.071
Mankato, Minn.	46	3.036	37	2.738
Des Moines, Ia.	36	2.376	29	2.146
Davenport, Ia	39	2.571	31	2.294
Mason City, Ia.	42	2.772	33.5	2.479
St. Louis, Mo.	33	2.178	26.5	1.961
Kansas City, Mo.	28	1.848	22.5	1.665
St. Joseph, Mo.	28	1.848	22.5	1.665
Fargo, N. D.	63	4.158	50.5	3.737
Minot, N. D.	83	5.478	66.5	4.921
Huron, S. D.	53	3.498	42.5	3.145
Wichita				
From Ponca City	7.5	*0.495	7.5	†0.555
From Tulsa	12.5	*0.825	12.5	†0.925
From Cushing	11	*0.726	11	†0.814

*This rate also includes distillate rate at 6.6 lbs. per gal.

**This rate applies only to residual fuel and gas oil.

†This rate is exclusive of distillate which is based on 6.6 lbs. per gal. from Ponca City, Tulsa and Cushing, Okla., to Wichita. Includes only gas oil and fuel oil.

NOTE: There is no Group 3 rate to Wichita, Kans.

(f) Prices FOB Central Michigan refinery group basis for shipment within Michigan; shipments may originate at plants outside Central group. (g) Excluding Detroit shipment. (h) For shipment to Ark. points only. (i) Quotations. (j) Sale. (k) Sales. (l) Pittsburgh district prices excluded.

SEABOARD PRICES EXPORT AND COASTWISE

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

Atlantic Coast

(Prices are of refiners, FOB their refineries & their tanker terminals, & of tanker terminal operators, FOB their terminals)—Prices Effective Dec. 9

MOTOR GASOLINE

District:	Min. 80 Oct. '39 Research (Max. 2 cc. Lead)	72-74 Oct. (ASTM)	68-70 Oct. (ASTM)	65-66 Oct. (ASTM)	60-64 Oct. (ASTM)
N. Y. Harb.	5.75 – 6.50	5.50 – 6.20	5.50	5.50 (2)	.....
N. Y. Harb., barges	5.75 – 7.00	5.25 (1)	5.25 (2)	5.25–5.50 (2)	.....
Albany	5.70 (1)	6.10	.....	.....	.....
Philadelphia	5.75 – 7.25	5.50 – 7.00	5.50 – 6.75	.....	6.50 (1)
Baltimore	5.75 – 7.25	5.50 – 6.75	5.50 – 6.00	5.50 (1)	.....
Norfolk	5.75 – 7.25	5.50 – 6.75	6.00 – 6.50	5.50 (1)	.....
Wilm'ton	6.50 – 7.25	5.75 – 6.55	6.00 – 6.50	5.50 (1)	6.25 (1)
Char'ston	6.25 – 7.05	5.75–6.60 (2)	5.875–6.50 (2)	5.50 (1)	.....
Savannah	6.25–6.50 (2)	6.00 – 6.50	5.875–6.375	.....	6.00 (1)
Jacksonville	6.25–6.50 (2)	6.00 – 6.50	5.875–6.25	.....	6.00 (1)
Miami	6.25–6.50 (1)	6.00 (1)	5.875–6.00 (2)	.....	.....
Tampa	6.25–6.50 (2)	6.00 (1)	5.875–6.25	.....	.....
Pensacola	6.00–6.25 (1)	....	5.50–5.75 (1)	.....	.....
Mobile	5.75–6.00 (2)	5.50 (1)	5.375–5.625 (2)	.....	.....
Portland	5.70 (2)	6.20	6.20 (1)	.....	.....
Boston	5.70 (2)	5.75 – 6.20	5.75 (1)	5.25 – 5.75	.....
Providence	5.60 – 6.50	6.20	....	.....	.....

FUEL OILS

	KEROSINE and /or NO. 1 FUEL	No. 2	No. 3	No. 5	No. 6
N. Y. Harb.	5.30 – 5.50	4.70	4.70	$1.45 –$1.55	$1.15 –$1.25
N. Y. Harb., barges	5.20 – 5.40	4.60	4.60	.....	.....
Albany	5.60	5.00	5.00 (1)	$1.85 (1)	$1.45 (1)
Philadelphia	5.25 – 5.75	4.75	4.75	$1.37 –$1.47	$1.15 –$1.25
Baltimore	5.25	4.50	4.50	$1.37 (1)	$1.15 –$1.25
Norfolk	5.25 – 5.375	4.50	4.50	.....	$1.25 (2)
Wilmington	5.25 – 5.375	4.50	.....	.....	.....
Charleston	5.25 – 5.375	4.50 (2)	.....	.....	$1.20 (2)
Savannah	5.125– 5.25	.....	.....	.....	$1.20 (1)
Jacksonville	5.125– 5.25	4.25 (1)	4.25 (1)	.....	$1.20 (1)
Miami	5.125–5.25 (2)	.....	.....	.....	.....
Tampa	5.00 – 5.25	4.25 (1)	.....	.....	$1.15 (1)
Pensacola	4.875– 5.00 (1)	.....	.....	.....	.....
Mobile	4.875– 5.00	.....	.....	.....	.....
Portland	5.70	5.10	5.10	$1.85 (1)	$1.25 –$1.45
Boston	5.60	5.00	5.00	$1.55 (2)	$1.25
Providence	5.60	5.00	5.00	$1.50 –$1.55	$1.25

	Bunker C Fuel Ships' bunkers (Ex Lighterage)	Diesel Oil Ships' bunkers (Ex Lighterage)	Diesel Oil Shore Plants	Gas House Gas Oil 28-34 Gravity
N. Y. harbor	$1.15 –$1.25	$1.95	4.70	4.80
Albany	$1.45 (1)	$1.95	4.80	....
Philadelphia	$1.15 –$1.25	$1.95	....	....
Baltimore	$1.15 –$1.25	$1.95	4.50	4.50
Norfolk	$1.25	$1.95	4.50	4.50
Charleston	$1.20	$1.95	4.50	4.50
Savannah	$1.20 (1)	$1.785–$1.95	....	....
Jacksonville	$1.20	$1.785–$1.95	....	....
Tampa	$1.15	$1.785–$1.95	....	....
Portland	$1.25 –$1.45	$2.05	5.10	5.20
Boston	$1.25	$1.95	5.00	5.10
Providence	$1.25	$1.95	5.00	5.10

New York Export Lubes

(Penna. Products in bbls. FAS New York)

Prices Effective	Dec. 9	Dec. 2
Bright stock:		
Light, 25 p.t.	20.50 (1)	20.50 (1)
Neutral oil:		
200 3 color, 25 p.t.	....	....
150 3 color, 25 p.t.	25.50 (1)	25.50 (1)
600 s.r., unfilt.	16.00 (1)	16.00 (1)
650 s.r., unfilt.	17.00 (1)	17.00 (1)
600 fl. s.r.	18.00 (1)	18.00 (1)
630 fl., s.r.	20.00 (1)	20.00 (1)

Wax

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, FAS. c.l. Domestic prices, FOB. refr'ies., in bags, c.l., with 0.2c discount allowed for shipment in bulk, except where noted. Scale solid; fully refined slabs in bags)

Prices Effective Dec. 9

	New Orleans Export	N. Y. Domestic	N. Y. Export
Crude Scale:			
124-6 Yellow	2.85-3.00 (1)	....	2.85-3.00 (1)
122-4 White	....	2.85-3.00	2.85-3.00
124-6 White	2.85-3.25 (2)	2.85-3.00	2.85-3.00
Fully Refined:			
123-5	....	5.60	5.60(2)
125-7	5.60(1)	5.60	5.60
128-30	6.15(1)	5.60–5.70(i)	5.60
130-2	6.15(1)	5.85(i)	5.85
133-5	6.40(1)	6.15(i)	6.15
135-7	7.15(1)	6.40(i)	6.40
108-11 White Match	....	....	3.25(l&j)

Naphtha

Prices Effective Dec. 9	V.M.&P. Naphtha	Mineral Spirits
Baltimore	9.50	8.00
New York Harbor	8.80 – 9.50	8.00 – 8.50
Philadelphia district	10.00	8.00 – 9.00
Boston	9.00	8.75 – 9.25
Providence	9.00	8.75

Pacific Export

(Quotations at seaboard, Los Angeles, cargo lots, except where otherwise noted.)

Prices Effective	Dec. 9	Dec. 2
375 e.p. blend, 70 oct.	4.50 – 5.625	4.50 – 5.625
390 e.p. blend, 68 oct.	4.375– 5.50	4.375– 5.50
390 e.p. blend, 66 oct.	4.375– 5.375	4.375– 5.375
400 e.p. blend, 65 oct. min.	4.25 – 5.25	4.25 – 5.25
U. S. Motor, under 65 octane	4.25 – 5.125	4.25 – 5.125
38-40 grav. w.w kero., 150 fire point	4.50 – 5.00	4.50 – 5.00
41-43 grav., w.w. kero.	4.75 – 5.00	4.75 – 5.00
44 grav., w.w. kero.	5.00 – 5.50	5.00 – 5.50
Diesel fuel, 24 & above	$1.25 –$1.30	$1.25 –$1.30
Diesel fuel, under 24	$1.15 –$1.25	$1.15 –$1.25
30-34 grav. diesel (gas oil) Pac. Spec. 200	$1.25 –$1.35	$1.25 –$1.35
Grade C fuel, Pac. Spec. 400	$0.60 –$0.65	$0.60 –$0.65
In Ships' Bunkers, or deep tank lots:		
Diesel fuel, Pac. Spec. 200	$1.35 –$1.45	$1.35 –$1.45
Grade C fuel, Pac. Spec. 400	$0.65 –$0.75	$0.65 –$0.75

Pacific Export (Cont'd)

Prices Effective	Dec. 9	Dec. 2
Cased Goods: (Per case)		
U. S. M.	$1.35 –$1.45	$1.35 –$1.45
375-400 e.p. blend, 65 oct. & above	$1.50 –$1.60	$1.50 –$1.60
400 e.p. blend, under 65 oct.	$1.40 –$1.50	$1.40 –$1.50
40-43 grav. w.w. kero., 150 fire point	$1.30 –$1.40	$1.30 –$1.40
Kero., p.w.	$1.25 –$1.35	$1.25 –$1.35

Tanker Rates

(Approximate rates. Cents per bbl.)

Gulf-N. Atlantic: (not E. of N.Y.)	Last Paid	Owners Ask
Hvy. Crude & fuel (10 to 19.9 gravity)	60	..
Light Crude, (30 grav. or Lighter)	(a)	..
Gasoline	70	..
Kerosine	75	..
No. 2 Fuel	80(b)	..

Gulf Coast

(Prices for sales made or firm offers reliably reported for sales pending in cargoes FOB ship at Gulf, for minimum of 20,000 bbls. Prices are by refiners only to other refiners, export agents, or to large tanker terminal operators at the customary trade specifications noted.)

Prices Effective Dec. 9

Motor Gasoline Domestic	
Min. 80 oct., '39 Research, max. 2 cc. lead	3.625– 5.00
60-62, Gravity, Max. 400 e.p.	
72-74 oct. leaded (ASTM)	3.50 – 4.75
70 oct. unleaded "	4.25
68 oct. " "	3.75 – 4.75
65 oct. " "	3.50 – 4.625
60 oct. " "	3.25 – 4.50
41-43 w.w. kerosine	3.625– 4.00
No. 2 fuel	3.125– 3.75
Gas Oil—Less than ½ of 1% sulfur	
Below 43 diesel index	3.125– 3.25
43-47 " "	3.125– 3.25
48-52 " "	3.125– 3.625
53-57 " "	3.50
58 & above diesel index	3.75
Diesel Oil, ships' bunkers (ex-lighterage)	$1.50 –$1.70
Bunker C, " "	$0.80 –$0.90
Bunker C, cargoes	$0.80 –$0.85

Motor Gasoline Export	
60-62 Gravity, Max. 400 e.p.	
72-74 oct. leaded (ASTM)	3.50 – 4.75
70 oct. unleaded "	4.25
68 oct. " "	3.75 – 4.75
65 oct. " "	3.50 – 4.625
60 oct. " "	3.25 – 4.50
61-63 Gravity, Max. 390 e.p.	
72-74 oct. leaded (ASTM)	3.50 – 4.25
60 oct. unleaded "	3.25 – 4.00
64-66 Gravity, Max. 375 e.p.	
72-74 oct. leaded (ASTM)	3.50 – 4.25
60 oct. unleaded "	3.25 – 4.00
41-43 w.w. kerosine	3.625– 4.00
Gas Oil—Less than ½ of 1% sulfur	
Below 43 diesel index	3.125– 3.25
43-47 " "	3.125– 3.25
48-52 " "	3.125– 3.625
53-57 " "	3.50
58 & above diesel index	3.75

MID-CONTINENT LUBES

(At Gulf; in packages, FAS.; in bulk FOB terminals)

	Dec. 9 New Steel Drums	Bulk
200 vis. D. 210 brt. stock	25.50–25.80 (2)	19.80 (2)
150 vis. D 210 brt. stock 0-10 p.p.	21.50–21.80 (2)	15.80 (2)
10-25 p.p.	21.00 (1)	15.30 (1)
100 vis. D 210 brt. stock 0-10 p.p.	21.00 (1)	15.30 (1)
10-25 p.p.	20.50 (1)	14.80 (1)
200 vis. No. 3 col. neutral: 0-10 p.p.	17.00 (1)	11.30 (1)

SOUTH TEXAS LUBES

(Vis. at 100°, c. t. 0, blk exprt. shp., FOB terminals)

Unfiltered Pale Oils: Vis. Color	Dec. 9	Dec. 2
100 No. 3	6.00	6.00
200 No. 3	7.50	7.50
300 No. 3	8.00	8.00
500 No. 3½	9.00	9.00
750 No. 4	9.50	9.50
1200 No. 4	10.00 –11.00	10.00 –11.00
2000 No. 4	10.25	10.25
Red Oils: Vis. Color		
100 No. 5-6	6.00	6.00
200 No. 5-6	7.50	7.50
300 No. 5-6	8.00	8.00
500 No. 5-6	9.00	9.00
750 No. 5-6	9.50	9.50
1200 No. 5-6	10.00 –11.00	10.00 –11.00
2000 No. 5-6	10.25	10.25

(a) No rate for light crude on last "dirty" fixture. (b) "Clean" tanker fixed same day for No. 2 fuel only at 67.5c. (i) Shipments in bags or in bulk. (j) Shipment in tight barrels.

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include* 1.5c *federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes where levied are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for Feb.* 21, 1940. *These prices in effect Dec.* 9, 1940 *as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Esso (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
*Atlantic City, N. J.	6.5	8.1	4.5	7.9
*Newark, N. J.	6.5	8.1	4.5	7.9
Annapolis, Md.	7.35	8.85	5.5	9.5
Baltimore, Md.	6.75	8.25	5.5	8.5
Cumberland, Md.	8.15	9.65	5.5	10
Washington, D. C.	7	8.5	3.5	9.5
Danville, Va.	7.95	10.45	6.5	9
Norfolk, Va.	6.75	9.25	6.5	10.5
Petersburg, Va.	7.05	9.55	6.5	11.2
Richmond, Va.	7.05	9.55	6.5	10.5
Roanoke, Va.	8.25	10.75	6.5	11
Charleston, W. Va.	7.55	10.05	6.5	12.6
Parkersburg, W. Va.	6.85	9.35	6.5	11.2
Wheeling, W. Va.	7.85	10.35	6.5	11.8
Charlotte, N. C.	8.9	7	7.5	10.3
Hickory, N. C.	9.45	10.95	7.5	10.8
Mt. Airy, N. C.	9.3	8.5	7.5	10.7
Raleigh, N. C.	8.65	8.5	7.5	10
Salisbury, N. C.	8.95	7	7.5	10.4
Charleston, S. C.	6.75	9.25	7.5	....
Columbia, S. C.	7.6	10.1	7.5	....
Spartanburg, S. C.	8.3	10.8	7.5	12.2

	Mineral Spirits T.W.	V.M.P.& T.W.
Newark, N. J.	11.5	15.5
Baltimore, Md.	15.5	....
Washington, D. C.	15	....

Fuel Oils—T.W.	No. 1	No. 2	No. 3
Atlantic City, N. J.	7.9	6.7	6.7
Newark	7.9	6.7	6.7
Annapolis, Md.	....	6.75	....
Baltimore	7.5	6.75	6.25
Washington, D. C.	7.75	7	7
Norfolk, Va.	7.25	6.25	6.25
Petersburg	7.5	6.5	....
Richmond	7.5	6.5	6.5
Charlotte, N. C.	8.8	7.75	....
Hickory	....	8	....
Raleigh	9	7.50	....
Charleston, S. C.	....	6.75	....
Columbia	....	7.75	....
Spartanburg	10.05	8	....

*Effective Sept. 19, 1940, minimum retail resale price of 10.4c posted thru New Jersey.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w. price, thru territory, except New Jersey. While above posted prices continue at Atlantic City and Newark, dealers will pay net price of 7.5c per gal. for Esso; dealers having pumps marked only Esso, Esso Extra and Standard White gasoline will pay 7c per gal. for Esso.

Kerosine—1c off t.w. price for 25 gals. or more, under contract thru territory (Baltimore city contract not necessary) except no discount in state of New Jersey.

Naphthas—To buyers taking following quantities at one time: Newark, 2c per gal. on 200 gals. or more, less than 200 gals. 0.5c higher price; Baltimore, 2c off on 25 to 100 gals. and 3c on over 100 gals.; Washington, 2c off to contract buyers.

Socony-Vacuum Oil Co., Inc.

Socony Mobilgas (*Regular Grade*)

	Com. T.C.	Com. Cons. T.W.	Div. Dlr. T.W.	Gasoline Taxes
New York City:				
Manhattan & Bronx	6.4	6.1	7	*5.5
Kings & Queens	6.4	6.1	7	*5.5
Richmond	6.4	6.1	7.2	*5.5
Albany, N. Y.	6.7	6.7	7.7	5.5
Binghamton, N. Y.	7.8	7.8	8.8	5.5
Buffalo, N. Y.	6.9	6.9	7.9	5.5
Jamestown, N. Y.	6.7	6.7	7.6	5.5
Plattsburg, N. Y.	7	7.7	8.7	5.5
Rochester, N. Y.	7.3	7.3	8.3	5.5
Syracuse, N. Y.	7	7	8.7	5.5
Bridgeport, Conn.	6.7	6.7	7.3	4.5
Danbury, Conn.	7.3	7.3	8.1	4.5
Hartford, Conn.	7	6.5	7.5	4.5
New Haven, Conn.	6.7	6.8	7.3	4.5
Bangor, Me.	6.6	7.3	8.3	5.5
Portland, Me.	6.2	6.9	6.2	5.5
Boston, Mass.	6.2	6.2	7.2	4.5
Concord, N. H.	7.4	7.7	8.7	5.5
Lancaster, N. H.	8.2	8.7	9.7	5.5
Manchester, N. H.	7.3	7.4	7.1	5.5
Providence, R. I.	6.2	6.2	7.7	4.5
Burlington, Vt.	7.3	7.7	8	5.5
Rutland, Vt.	7.4	7.9	8.6	5.5

	Mineral Spirits T.W.	V.M.&P. T.W.
Buffalo, N. Y.	9.4	10.1
†New York City	8.2	8.8
Rochester, N. Y.	10.2	10.9
Syracuse, N. Y.	11.1	11.8
Boston, Mass.	11	11
Bridgeport, Conn.	11.5	12
Hartford, Conn.	11	11.5
Providence, R. I.	11	12

	Kerosine Yard	Kerosine TW	Mobilfuel Diesel TC	Mobilfuel Diesel TW	Mobilheat Fuel Yard	Mobilheat Fuel TW
New York:						
Manhat'n & Bronx	....	8.1	....	....	....	6.6
Kings & Queens	5.6	8.1	....	....	....	6.6
Richmond	5.4	8.1	....	....	....	6.6
Albany	5.8	8	5.2	7.2	5.2	6.9
Binghamton	7	9	....	....	....	....
Buffalo	6.2	7.9	5.8	7.8	....	....
Jamestown	5.8	7.9	....	....	....	....
Plattsburg	6.6	8.6	....	....	....	....
Rochester	6.5	8.5	....	....	6.1	7.4
Syracuse	6.9	8.9	....	....	....	....
Conn:						
Bridgeport	6.2	8.2	....	....	....	....
Danbury	....	8.4	....	....	....	....
Hartford	5.9	7.9	....	7.6	5.3	6.9
New Haven	5.8	7.4	....	....	5.4	7.1
Maine:						
Bangor	6.5	8.5	....	....	5.9	7.4
Portland	6.1	8.4	5.5	7.5	....	....
Mass.:						
Boston	5.9	8.4	5.4	7.4	5.4	7
N. H.:						
Concord	7	9	....	....	....	....
Lancaster	8	10	....	....	....	....
Manchester	....	9.2	....	....	6.2	7.7
R. I.:						
Providence	6	8.4	5.4	7.4	5.4	6.9
Vermont:						
Burlington	6.6	8.6	....	....	6	7.6
Rutland	7	9	....	....	....	....

*Plus 2% city sales tax computed at time of each sale.

†Prices apply to consumers only in quantities over 1000 gals. annually; for quantities under 1000 gals. annually, add 0.5c per gal.

Discounts: Gasoline—To undivided dealers, 0.5c less than divided dealer t.w. Diesel—On t.w. deliveries, 0.5c for at least 400 gals.; 1c for full tank truck.

Atlantic Refining

Atlantic White Flash Gasoline (*Regular Grade*)

	Commercial T.C.	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	7	**8	5.5	10
Pittsburgh	7.5	9.5	5.5	10.5
Allentown	7.5	9	5.5	10.5
Erie	7	9.5	5.5	10
Scranton	6.4	6.9	5.5	10.5
Altoona	7.5	9.5	5.5	10.5
Emporium	7.5	9.5	5.5	10.5
Indiana	7.5	9.5	5.5	10.5
Uniontown	7.5	9.5	5.5	10.5
Harrisburg	7.5	9	5.5	10.5
Williamsport	7.5	9	5.5	10
Dover, Del.	....	8.5	5.5	10.5
Wilmington	....	8	5.5	10
Boston, Mass.	....	7.2	4.5	8.4
Springfield, Mass.	....	6.8	4.5	9.1
Worcester, Mass.	....	7.5	4.5	8.5
Fall River, Mass.	....	7.1	4.5	8.6
Hartford, Conn.	....	7.5	4.5	8.6
New Haven, Conn.	....	7.3	4.5	8.6
Providence, R. I.	....	7.7	4.5	8.6
Atlantic City, N. J.	....	7.5	4.5	7.9
Camden, N. J.	....	7.5	4.5	7.9
Trenton, N. J.	....	7.3	4.5	7.9
Annapolis, Md.	....	8.85	5.5	9.5
Baltimore, Md.	....	8.25	5.5	8.5
Hagerstown, Md.	....	9.35	5.5	10
Richmond, Va.	....	9.55	6.5	10.5
Wilmington, N. C.	....	9.35	7.5	9.3
Brunswick, Ga.	....	7.5	7.5	*9
Jacksonville, Fla.	....	6.5	8.5	10

	Mineral Spirits T.W.†	V.M.&P. T.W.†
Philadelphia, Pa.	12	14.5
Lancaster, Pa.	13.5	16
Pittsburgh, Pa.	14.5	14.5

Fuel Oils—T.W.	1	2	3	5	6
Phila., Pa.	8	6.75	6.75	4.25	3.50
Allentown, Pa.	8.5	7	7	....	....
Wilmington, Del.	8.00	6.75	6.75	....	....
Springfield, Mass.	9.1	7.5	7.5	....	....
Worcester, Mass.	8.5	7.2	7.2	....	....
Hartford, Conn.	8.6	6.9	6.9	....	....

*Does not include 1c Georgia kerosine tax.

**Note—Special allowance of 1c to dealers.

†Mineral Spirits prices also apply to Stoddard Solvent; V.M.&P. prices also apply to Light Cleaners Naphtha.

Discounts:

‡Gasoline — to undivided dealers, 0.5c off dealer t.w., except Georgia & Florida dealer t.w. and undivided dealer t.w. prices are same.

Kerosine—Thru Penna. & Delaware, 2c off t.w. price on t.w. deliveries of 25 gals. or more at one time.

Naphthas—Philadelphia, 200 gals. or more at one time, 2c off, Lancaster, contract buyers taking 1000 gals. or more per year, one drum up, 2c off; non-contract buyers, 200 gals. or more at one time, 2c off. Pittsburgh, 500 gals. or more at one time, 2c off.

S. O. Ohio††

***Sohio X-70 Gasoline (*Regular Grade*)**

	Consumer T.W.	**Resellers	‡S.S.	Gasoline Taxes	†Kerosine T.W.
Ohio, Statewide	10.5	9	12.5	5.5	8
Akron	10.5	7.5	9.5	5.5	8
Cincinnati	10.5	7.5	10	5.5	8
Cleveland	10.5	8	11	5.5	8
Columbus	10.5	8	11	5.5	8
Dayton	10.5	7.5	10	5.5	8
Marietta	10.5	8	10.5	5.5	8
Portsmouth	10.5	8.5	11.5	5.5	8
Toledo	10.5	7.5	10	5.5	8
Youngstown	10.5	8	11	5.5	7.5

Esso Aviation Gasoline—Thru Ohio

	Consumer T.W.	Gasoline Taxes
74 octane	15.5	5.5
80 octane	16.5	5.5
87 octane	17.5	5.5

†Naphthas—Statewide	T.W.
S.R. Solvent	12.75
D.C. Naphtha	13.25
V.M.&P. Naphtha	13.25
Varnolene	13.25
Sohio Solvent	13.25

Fuel Oils—T.W.	No. 1	No. 2	No. 3	No. 4
Ohio, Statewide	8.0	8.0	7.5	....
Toledo	7.5	7.5	7.0	....
Cleveland	9.5	9.5	9.0	6.75

*Renown (third-grade) prices are same as X-70 unless otherwise noted.

**Except authorized agents.

†Kerosine prices are ex 1c state tax. Naphtha prices are ex 1.5c federal & 4c state tax.

‡Prices at company-operated stations.

††Statewide prices are subject to exceptions other than those shown.

Discounts:

Esso aviation—on contract to hangar operators and resellers, 2c off consumer t.w.

Fuel Oils—Statewide and Toledo prices are for t.w. deliveries of less than 50 gals.; t.w. and drum deliveries of over 50 gals. are 0.5c less. Cleveland Nos. 1, 2, and 3 prices are for bulk deliveries of 5 to 99 gals.; 100 gals. and over are 2c less. Cleveland No. 4 price is for full compartment hose dump only.

Naphthas—to contract consumers off t.w. prices; 300 to 999 gals., 0.5c; 1000 to 2499 gals., 0.75c; 2500 to 4999 gals., 1c; 5000 or more gals., 1.5c.

S. O. Kentucky

Crown Gasoline (*Regular*)
Standard (*Third Grade*)

	†Net Dealer Crown	Standard	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	7	6.5	6.5	9
Lexington, Ky.	9	7	6.5	9
Louisville, Ky.	8.5	6.5	6.5	8.5
Paducah, Ky.	6.5	6	6.5	8.5
Jackson, Miss.	8.5	7.5	7.5	*8.5
Vicksburg, Miss.	8	7	7.5	*8
Birmingham, Ala.	8	7	*8.5	9
Mobile, Ala.	6	5	*9.5	8
Montgomery, Ala.	8.5	7.5	*9.5	*9
Atlanta, Ga.	7.5	6.5	7.5	*7
Augusta, Ga.	9	8.5	7.5	*8.5
Macon, Ga.	7.5	6.5	7.5	*8
Savannah Ga.	8	7	7.5	*8
Jacksonville, Fla.	6.5	5.5	8.5	8
Miami, Fla.	6.5	5.5	8.5	8
Pensacola, Fla.	7.5	6.5	*9.5	8
Tampa, Fla.	6.5	5.5	8.5	8

*Taxes: In tax column are included these city and county gasoline taxes: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have 1c kerosine tax, Mississippi 0.5c, not included in above prices.

†Consumer t.w. prices are same as net dealer prices.

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Dealer Prices Crown Cons. T.W.	Red Crown	Stanolind	Gasoline Taxes	Kerosine T.W.
Chicago, Ill.	10.1	8.1	6.4	4.5	10
Decatur, Ill.	10.1	8.6	6.2	4.5	9.5
Joliet, Ill.	11.1	9.6	6.7	4.5	10
Peoria, Ill.	11.1	8.7	8.1	4.5	10
Quincy, Ill.	10.9	9.4	6.2	4.5	9.8
Indianapolis, Ind.	11.3	9.3	8.9	5.5	*10
Evansville, Ind.	11.1	9.6	8	5.5	*9.8

(Continued on next page)

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes:** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1.5c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes where levied are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for Feb. 21, 1940. These prices in effect Dec. 9, 1940 as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. Indiana (Cont'd)

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Dealer Prices Red Crown	Stano-lind	Gaso-line Taxes	Kero-sine T.W.
South Bend, Ind.	11.3	9.8	8 8	5.5	*10
Detroit, Mich.	9 6	8 1	7.1	4.5	7.6
Grand Rapids, Mich.	9.8	8.3	8	4.5	9.1
Saginaw, Mich.	10 4	8.9	8 4	4.5	9.1
Green Bay, Wis.	11 9	10 4	8 9	5.5	10.3
Milwaukee, Wis.	11.3	9 8	9 3	5.5	10.2
La Crosse, Wis.	11.5	10	9 5	5.5	10.4
Minneapolis-St. Paul.	11.5	9.7	7.3	4.5	10.4
Duluth, Minn.	11 9	10 4	9 9	4.5	10.8
Mankato, Minn.	11.5	10	8.5	4.5	9
Des Moines, Ia.	10.9	9.4	7.9	4.5	*9.8
Davenport, Ia.	11.1	9.6	8 1	4.5	*10
Mason City, Ia.	11.3	9 8	6.9	4.5	*10.2
St. Louis, Mo.	10.2	8 7	7	*4.5	9
Kansas City, Mo.	10.3	7.3	6.3	*4.5	8
St. Joseph, Mo.	10.4	8.5	7.5	*4.5	7.9
Fargo, N. D.	12.7	11.2	9	5.5	11.6
Huron, S. D.	12	10.5	10	5.5	10.9
Wichita, Kans.	9.3	7.8	5.5	4.5	7

Stanavo Aviation 73 Octane

Chicago, Ill.	14.9		
Detroit, Mich.	16.5		4.5
Milwaukee, Wis.	15.1		5.5
Minneapolis, Minn.	15.3		4.5
St. Louis, Mo.	14.5		3.5
Kansas City, Mo.	14.2		*4.5
Fargo, N. D.	16.5		5.5
Huron, S. D.	15.8		5.5

	Oleum Spirits	V.M.&P. Naphtha	Stani-sol	*Taxes
	(Prices are base prices before discounts)			
Chicago	12.7	13	12.4	4.5
Detroit	15.2	14.2	15.7	4.5
K. C., Mo.	12.9	13.9	13.4	1.5
St. Louis	13.2	14.2	12.4	1.5
Milwaukee	13.8	14.8	14.3	5.5
Minnep'ls	14	15	12.7	4.5

Fuel Oils T.W.	CHICAGO Standard Heater Oil
1-99 gals.	9
100-149 gals.	8
150 gals. & over	7.5

	Stanolex No. 1	Stanolex Furnace Oil
1-99 gals.	8.5	8.5
100-399 gals.	7.5	7.5
400 gals. & over	7	7

	Stanolex Fuel Oil A	Stanolex Fuel Oil B
1-399 gals.	6	6
400-799 gals.	5	5
80 gals. & over	4.75	4.75

Stanolex Bunker C Fuel Oil

1-999 gals.	4.75
1000 gals. & over	3.75

†Other Points:	Stanolex No. 1	Stanolex Furnace Oil
Indianapolis		*7.5
Detroit		6.6
Milwaukee	8.2	7.7
Minneapolis	7.5	7.5
St. Louis	7.4	6.5
Kansas City	6.8	6.8

*Taxes: In gasoline tax column are included these city taxes—Kansas City, St. Joseph, and St. Louis, 1c. Indiana kerosine and fuel oil prices are ex 4c state tax; Iowa kerosine prices are ex 3c state tax. In naphtha tax column are included 1.5c federal tax and state taxes.

†Prices for small-lot deliveries range up to 2c higher than above prices.

S. O. Nebraska

Standard Red Crown Gasoline (*Regular Grade*)

	T.W.	Dealer	Gaso-line Taxes	Kero-sine T.W.
Omaha	10.9	9.4	6.5	9.5
McCook	10.5	7.9	6.5	9
Norfolk	11	8.9	6.5	9.9
North Platte	11.3	9	6.5	10.2
Scottsbluff	10.9	8	6.5	10 8

S. O. Louisiana

Esso (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Little Rock, Ark.	6.75	8.5	8	10
Alexandria, La.	6.25	8.75	8.5	*9.5
Baton Rouge, La.	6.25	8.75	8.5	*9.5
New Orleans, La.	5.75	8.25	8.5	*9
Lake Charles, La.	6.25	8.75	8.5	*9
Shreveport, La.	5.5	8	8.5	*9
Lafayette, La.	6.5	9	8.5	*9
Bristol, Tenn.	9.75	10.25	8.5	12
Chattanooga, Tenn.	9	8.85	8.5	12
Knoxville, Tenn.	9.5	11.5	8.5	12.5
Memphis, Tenn.	7.5	9.5	8.5	11
Nashville, Tenn.	8.5	9	8.5	11

*New Orleans kerosine price is ex 1c parish tax, and all Louisiana kerosine prices are ex 1c state tax.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w.

Humble Oil & Refining Co.

Humble Motor Fuel (*Regular Grade*)

	Tank Truck	Retail	Gaso-line Taxes	Kero-sine T.W.
Dallas, Tex.	6	10	5.5	6
Ft. Worth, Tex.	6	10	5.5	7
Houston, Tex.	7	11	5.5	8
San Antonio, Tex.	7	11	5.5	8

Thriftane
(Leaded, 67 Octane, Purple Gasoline)

Dallas	5	8	5.5
Ft. Worth	5	8	5.5
Houston	5	8	5.5
San Antonio	5	8	5.5

74 Octane Aviation Gasoline, Clear

	Tank
FOB Baytown, Tex.	8.5

*To all classes of dealers & consumers.

The Texas Co.

	Gasoline—Dealer T.W. Fire-Chief (*Regular*)	Indian (*3rd Grade*)	Gaso-line Taxes
Dallas, Tex.	8	6	5.5
Ft. Worth, Tex.	8	6	5.5
Wichita Falls, Tex.	8	6	5.5
Amarillo, Tex.	8	6	5.5
Tyler, Tex.	8	6	5.5
El Paso, Tex.	9	8	5.5
San Angelo, Tex.	8	6	5.5
Waco, Tex.	8	6	5.5
Austin, Tex.	8	6	5.5
Houston, Tex.	8	6	5.5
San Antonio, Tex.	8	6	5.5
Port Arthur, Tex.	8	6	5.5

Continental Oil

	Conoco Bronz-z-z (*Regular*) T.W.	De-mand (*3rd Grade*)	Gaso-line Taxes	Kero-sine T.W.
Denver, Col.	9	8	5.5	10.5
Grand Junction, Col.	11	10	5.5	12
Pueblo, Col.	10	8	5.5	9
Casper, Wyo.	11	10	5.5	11.5
Cheyenne, Wyo.	9	8	5.5	11
Billings, Mont.	10	9	6.5	12
Butte, Mont.	9	8	6.5	13
Great Falls, Mont.	9	8	6.5	12
Helena, Mont.	9	8	6.5	12.5
Salt Lake City, Utah	10.5	9.5	5.5	14
Boise, Ida.	12	11	*6.6	16
Twin Falls, Ida.	13	12	*6.6	16.5
Albuquerque, N. M.	9	8	*7	9.5
Roswell, N. M.	7	6	*7	8
Santa Fe, N. M.	9.5	8.5	*7.5	9.5
Ft. Smith, Ark.	8	5.75	5.5	6.5
Little Rock, Ark.	8	5.5	8	8
Texarkana, Ark.	8	6	5.5	6
Muskogee, Okla.	8	7	5.5	7
Oklahoma City, Okla.	7	6	5.5	6.5
Tulsa, Okla.	7	6	5.5	6

Conoco Special Gasoline (Aviation)

	T.W.	Gasoline Taxes
Denver, Colo.	13.5	5.5
Cheyenne, Wyo.	13.5	5.5
Helena, Mont.	13.5	6.5
Salt Lake City, Utah	18	5.5
Albuquerque, N. M.	14	*7

*Taxes: In gasoline tax column are included these city taxes—Albuquerque and Roswell, 0.5c; Santa Fe 1c. Idaho tax includes 1 mill tax for toll bridges.

S. O. California

Standard Gasoline (*Regular Grade*)

	Tank Truck	Retail	Gaso-line Taxes	Kero-sine T.W
San Francisco, Cal.	12	13	4.5	11.5
Los Angeles, Cal.	11.5	12.5	4.5	10
Fresno, Cal.	13	14	4.5	12.5
Phoenix, Ariz.	14	15	6.5	*12.5
Reno, Nev.	14	15	5.5	13.5
Portland, Ore.	12.5	13.5	6.5	13.5
Seattle, Wash.	12.5	13.5	6.5	13.5
Spokane, Wash.	14	15	6.5	16.5
Tacoma, Wash.	12.5	13.5	6.5	13.5

Flight Gasoline (*Third Grade*)

San Francisco, Cal.	10	11	4.5	....
Los Angeles, Cal.	9.5	10.5	4.5	....
Fresno, Cal.	11	12	4.5	....
Reno, Nev.	12	13	5.5	....
Phoenix, Ariz.	11	12	6.5	....
Portland, Ore.	10.5	11.5	6.5	....
Seattle, Wash.	10.5	11.5	6.5	....
Spokane, Wash.	12	13	6.5	....
Tacoma, Wash.	10.5	11.5	6.5	....

Stanavo Aviation Gasoline

Phoenix, Ariz.	17.5	..	6.5	....
Los Angeles, Cal.	15	..	4.5	....
San Francisco, Cal.	15.5	..	4.5	....
Reno, Nev.	17.5	..	5.5	....
Portland, Ore.	16	..	6.5	....
Seattle, Wash.	16	..	6.5	....
Spokane, Wash.	19	..	6.5	....

*Taxes: Arizona kerosine prices are ex 5c state tax.

Discounts:

To 100% dealers—3c off t.w. on Standard and Stanavo Aviation; 2c off t.w. on Flight.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline (*Regular Grade*)

	T.W.	Gasoline Taxes	Kero-sine T.W.
Hamilton, Ont.	16.5	8	17
Toronto, Ont.	16.5	8	17
Brandon, Man.	21	7	22.50
Winnipeg, Man.	20.5	7	22.5
Regina, Sask.	18	7	20
Saskatoon, Sask.	21	7	23
Edmonton, Alta.	18	7	20
Calgary, Alta.	16	7	18
Vancouver, B. C.	16	7	23
Montreal, Que.	16	8	16.5
St. John, N. B.	14.50	10	18
Halifax, N. S.	14.50	10	18

Discounts: Gasoline—Maritime Provinces—undivided & divided dealers, t.w. price; British Columbia—undivided and divided dealers, 2c off t.w. price; balance of territory—undivided dealers, 1c off t.w. price, divided dealers, t.w. price.

Price Changes

(These changes have been made in price tables)

S. O. New Jersey—Kerosine:
Charleston, S. C. and Columbia, S. C. t. w. discontinued.

Socony-Vacuum—Mobilgas:
Price changes ranging from cuts of 0.5c to advances of 1.8c, effective Dec. 3.

Socony-Vacuum—Kerosine:
Danbury t. w. cut 0.3c, Nov. 29.

Atlantic Refining—White Flash:
Boston, Providence, Springfield and Fall River dealer t. w. up 0.3c, Dec. 4.
Worcester and Hartford dealer t. w. up 0.5c, Dec. 4.
New Haven dealer t. w. up 0.7c, Dec. 3.
Brunswick dealer t. w. cut 0.5c, Dec. 5.
Jacksonville dealer t. w. cut 1c, Nov. 26.

Atlantic Refining—Kerosine:
Wilmington, N. C. t. w. up 0.5c, Nov. 27.

S. O. Kentucky—Crown and Standard:
Jacksonville, Miami and Tampa cut 1c, Nov. 26.
Macon up 1c, Nov. 23; cut 1c, Nov. 27.

The Texas Co.—Fire Chief and Indian:
Dealer t. w. at all points, except El Paso, increased to 8c for Fire Chief and 6c for Indian, effective Dec. 3.

Continental Oil—Demand:
Correction: Ft. Smith cut 1c to 4.75c Oct. 25; advanced 1c to 5.75c Nov. 4. Texarkana advanced 1c, Sept. 24; cut 1c Oct. 1.
Oklahoma City t. w. up 0.5c, Dec. 5.

Continental Oil—Bronz-z-z:
Oklahoma City t. w. up 1c, Dec. 5.

Continental Oil—Kerosine:
Grand Junction t. w. has been 12c since Sept. 16.

CRUDE OIL PRICES

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN & CENTRAL STATES FIELDS

PENNSYLVANIA GRADE

Posted by Jos. Seep Purch. Agency (Nov. 12, 1940)

Bradford-Allegany $2.00
Southwest Penna $1.65
Eureka (West Va.) $1.59
Corning, O. (Nov. 4, 1939) $1.12

Posted by Tide Water Assoc. Oil Co. (Nov. 12, 1940)

Bradford-Allegany $2.00

Posted by The Pennzoil Co. (Nov. 12, 1940)

National Transit $1.93*

Posted by Valvoline Pipe Lines (Nov. 12, 1940)

Bradford (Elk & McKean Counties, Pa.) $2.00
Warren, Forest, Venango, Clairon & Butler Counties, Pa $1.93
Allegheny, Beaver, Washington & Greene Counties, Pa $1.65
West Virginia $1.59
South Eastern Ohio $1.55

*Applies to Cochran, Franklin, Hamilton & Doolittle districts; prices in other lower districts range down to $1.88 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co. (Aug. 24, 1940)

Midland, Midland County $1.12
Sherman $1.07
Clare-Freeman $1.07

Posted by Simrall Corp. (Aug. 24, 1940)

Crystal, Greendale, Porter, Vernon and Wise $1.12
Beaverton, Buckeye, Bentley, Edenville $1.10
Freeman and Redding $1.07
Arenac $0.92
West Branch $0.92

Posted by Sohio Corp. (Michigan Division)

Allegan & Kent Counties (Aug. 24, 1940) $1.18
Van Buren County (Nov. 1, 1940) $1.18

Posted by Bay Pipe Line Corp. (Aug. 24, 1940)

Bentley and Buckeye $1.10
Saginaw and Wise ..... $1.12 Clare $0.81

ILLINOIS-INDIANA-KENTUCKY

Posted by Sohio Corp.

Illinois Basin, including Griffin pool (Aug. 21, '40) $1.15
Carmi, Storms, Ill. area (Nov. 1, '40) 1.05
Birk City, Ky. area (Aug. 21, '40) 1.05
Corydon, Ky. area, Henderson (Aug. 21, '40) 1.05

Posted by Ohio Oil Co.

Illinois Basin (Aug. 21, '40) $1.15
Illinois & Western Indiana (Aug. 23, '40) 1.00

Posted by Carter Oil Co. (Aug. 21, '40)

Louden, Fayette Co. Ill. $1.15

Posted by Mohawk Oil Lines, Inc. (Aug. 21, '40)

So. Illinois heavy ..... $1.05 Light $1.15

Posted by Ashland Oil & Transp. Co.

Somerset oil in Ashland Lines, Ky.:
(Aug. 21, '40)

Big Sandy River ..... $1.12 Kentucky River $1.20

Posted by Owensboro-Ashland Co.

Owensboro, Ky. area (Aug. 21, '40) $1.10

MID-CONTINENT

OKLAHOMA-KANSAS-NORTH TEXAS

(See below for companies posting and effective dates)

Gravity	Schedule No. 1	Schedule No. 2	Schedule No. 3	Schedule No. 4	Schedule No. 5
Below 21	$0.70	$0.60	....	....	$0.63
21-21.9	.72	.63	....	....	.65
22-22.9	.74	.66	....	....	.67
23-23.9	.76	.69	....	....	.69
24-24.9	.78	.72	....	....	.71
25-25.9	.80	.75	....	$0.58	.73
26-26.9	.82	.78	....	.63	.75
27-27.9	.84	.81	....	.68	.77
28-28.9	.86	.84	$0.86	.73	.79
29-29.9	.88	.87	.88	.78	.81
30-30.9	.90	.90	.90	.82	.83
31-31.9	.92	.92	.92	.86	.85
32-32.9	.94	.94	.94	.90	.87
33-33.9	.96	.96	.96	.96	.89
34-34.9	.98	.98	.98	.98	.91
35-35.9	1.00	1.00	1.00	1.00	.93
36-36.9	1.02	1.02	1.02	1.02	.95
37-37.9	1.04	1.04	1.04	1.04	.97
38-38.9	1.06	1.06	1.06	1.06	.99
39-39.9	1.08	1.08	1.08	1.08	1.01
40 & above	1.10	1.10	1.10	1.10	1.03

Above schedules posted by:

No 1: S. O. Indiana Oct. 17, '38 in Okla. & Kans.

No. 2: Carter Oct. 13, '38 in Okla.; Magnolia Oct. 12, '38 in Okla.; Shell Oct. 22, '38 in Okla. & Kans.

No. 3: Continental Oct. 11, '38 in Okla. & Kans. with lowest grade Below 29; Texas Co. Oct. 12, '38 in Okla. & Kans.

No. 4: Sinclair-Prairie Aug. 31, '39 in Okla. & Kans.

No. 5: Stanolind Sept. 1, '40 in N. Texas; Continental Oct. 11, '38 in N. Texas; Texas Co. Oct. 12, '38 in N. & N. Central Texas; Magnolia Dec. 3, '38 in N. & N. Central Texas; Sinclair-Prairie July 16, '40 in Mexia & N. Central Texas. Texas Co.'s lowest grade is 28-28.9 at $0.79; Continental, Magnolia and Sinclair-Prairie postings begin with Below 29 at $0.79.

TEXAS & NEW MEXICO FIELDS

Posted by Humble Oil & Refining Co. (Oct. 2, '39)

Gravity	West Central Texas	East Central Texas	Gray County	Carson-Hutchinson Counties	Tomball, etc.	W. Texas & N. Mexico	Texas Gulf Cst. & Mirando	Anahuac-Dickinson	Refugio
Below 20	....	....	....	....	....	$0.53	$0.86	$0.81	$0.91
20-20.9	....	....	....	....	....	.55	.88	.83	.93
21-21.9	....	....	....	....	....	.57	.90	.85	.95
22-22.9	....	....	....	....	$0.95	.59	.92	.87	.97
23-23.9	....	$0.78	....	....	.97	.61	.94	.89	.99
24-24.9	$0.71	.80	....	....	.99	.63	.96	.91	1.01
25-25.9	.73	.82	....	....	1.01	.65	.98	.93	1.03
26-26.9	.75	.84	....	....	1.03	.67	1.00	.95	1.05
27-27.9	.77	.86	....	....	1.05	.69	1.02	.97	1.07
28-28.9	.79	.88	$0.72	$0.67	1.07	.71	1.04	.99	1.09
29-29.9	.81	.90	.74	.69	1.09	.73	1.06	1.01	1.11
30-30.9	.83	.92	.76	.71	1.11	.75	1.08	1.03	1.13
31-31.9	.85	.94	.78	.73	1.13	.77	1.10	1.05	1.15
32-32.9	.87	.96	.80	.75	1.15	.79	1.12	1.07	1.17
33-33.9	.89	.98	.82	.77	1.17	.81	1.14	1.09	1.19
34-34.9	.91	1.00	.84	.79	1.19	.83	1.16	1.11	1.21
35-35.9	.93	1.02	.86	.81	1.21	.85	1.18	1.13	1.23
36-36.9	.95	1.04	.88	.83	1.23	.87	1.20	1.15	1.25
37-37.9	.97	1.06	.90	.85	1.25	.89	1.22	1.17	1.27
38-38.9	.99	1.08	.92	.87	1.27	.91	1.24	1.19	1.29
39-39.9	1.01	1.10	.94	.89	1.29	.93	1.26	1.21	1.31
40 & above	1.03	1.12	.96	.91	1.31	.95	1.28	1.23	1.33

W. Central Tex. includes crudes purchased in Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton & Young Cos., Tex.

E. Central Tex. includes crudes purchased in Anderson, Cherokee, Limestone & Navarro Cos., Tex.

W. Tex. & N. Mex. includes crudes purchased in Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler & Yoakum Cos., Tex. & Lea Co., N. Mex.

Tex. Gulf Coast includes crudes purchased in Goose Creek, Sugarland, Thompsons, Mykawa, Amelia, Webster & Clear Lake fields.

Anahuac-Dickinson includes crudes purchased in Gillock, Cedar Point, Fairbanks, Turtle Bay, Hull, Pierce Junction & Raccoon Bend (Shallow Sand) fields.

Refugio includes crudes purchased in Saxet, East White Point, Greta, O'Connor-McFadden, Taft, Plymouth & Tom O'Connor fields.

Mirando includes crudes purchased in Duval, Jim Hogg, Webb & Zapata Cos., Tex. & in Heyser & Placedo fields

Postings for Raccoon Bend (Deep Sand) & Satsuma crudes are same as for Tomball.

East Texas $1.10
Van ..... .93
Pecos ..... .78
Talco $0.65
Conroe 1.27
Hardin 1.10
Flour Bluff & Jim Wells Cos. $1.23
Salt Flat, Darst Creek, Hilbig, Carroll, Clark & Zoboroski ..... .96

MAGNOLIA PETROLEUM CO.

Gray, Carson & Hutchinson Cos., Tex.—Dec. 3, '38—same as Humble.

Tomball, Tex.—Dec. 3, '38—same as Humble.

West Texas—Oct. 12, '38, in Crane, Glasscock, Howard, Mitchell, Upton & Winkler Cos. — same as Humble except Magnolia begins with Below 25 at $0.63.

N. Mexico—Oct. 15, '39, in Lea Co. — same as Humble except Magnolia begins with Below 25 at $0.63 and ends with 36 & above at $0.87.

Mirando, Tex.—Oct. 2, '39—same as Humble.

Beaumont, Tex.—Oct. 2, '39—same as Humble Texas Gulf Coast.

Cass & Panola Cos., Tex. — Oct. 12, '38 — Below 25 grav. oil at $0.73, plus 2c per degree of gravity to top of 40 & above at $1.05.

Following Tex. postings Oct. 12, '38:

East Texas $1.10
Darst Creek ..... .96
Luling ..... .87
Lytton Springs ..... .99
Cleveland (Liberty Co.) $1.14
Hardin (Liberty Co.) 1.02

SINCLAIR-PRAIRIE OIL MARKETING CO.

Gray, Carson & Hutchinson Cos., Tex.—
Aug. 31, '39—same as Humble.

West Texas & Lea Co., N. Mex.—Aug. 31, '39—same as Humble, except Sinclair begins with Below 25 at $0.63 and ends with 36 & above at $0.87.

Texas Gulf Coast—Oct. 3, '39—same as Humble.

East Texas (Oct. 2, '39) $1.10
Eddy Co., N. Mex. (Aug. 31, '39) .. .77
Long Lake, in Anderson, Leon & Freestone Cos., Tex. (Jan. 20, '40) $1.08

STANOLIND OIL PURCHASING CO.

Tomball, Tex.—Aug. 29, '39—same as Humble except Stanolind begins with Below 29 at $1.07.

Texas Gulf Coast—Oct. 3, '39, in Clinton field—same as Humble Texas Gulf Coast except Stanolind begins with Below 21 at $0.88.

West Beaumont, Jefferson Co., Tex.—Oct. 2, '39—same as Humble Texas Gulf Coast.

THE TEXAS CO.

(Effective Oct. 2, '39)

Panhandle, Tex.—Sweet crude same as Humble's Gray Co. except Texaco begins with 34-34.9 at $0.84. Sour crude same as Humble's Carson & Hutchinson Cos. except Texaco begins with 34-34.9 at $0.79.

West Texas & Lea Co., N. Mex.—Same as Humble except Texaco begins with Below 26 at $0.65 and ends with 36 & above at $0.87.

Texas Gulf Coast—Same as Humble except Texaco ends with 34 & above at $1.16.

Mirando-Duval, Tex.—Same as Humble except Texaco ends with 28 & above at $1.04.

Refugio, Tex.—Same as Humble except Texaco ends with 28 & above at $1.09.

Following Tex. postings Oct. 12, '38:

East Texas $1.10
Darst Creek ..... .96
Cass Co. $1.05
Conroe 1.27

SHELL OIL CO., INC.

West Texas & Lea Co., N. Mex.—Aug. 29, '39, & Yoakum Co., Tex. Sept. 1, '39—same as Humble except Shell ends with 36 & above at $0.87.

Fisher Co., Tex.—Aug. 29, '39—Below 25 grav. at $0.68, plus 2c per degree of gravity up to 40 & above at $1.00.

Following Tex. postings Oct. 5, '39:
East Texas $1.10
Livingston area, Polk Co. 1.10

Following Tex. postings Aug. 29, '39:
Pecos Co., except Yates Shallow pool $0.78
Pecos Co., Yates Shallow pool ..... .65

CONTINENTAL OIL CO.

Eddy Co., N. Mex.—Apr. 22, '40—Begins with 28-28.9 at $0.61, plus 2c per degree gravity up to 40 & above at $0.85.

Mirando, Tex.—Oct. 2, '39—same as Humble.

Refugio, Tex.—Oct. 2, '39—same as Humble.

PAN AMERICAN PIPE LINE CO.

Hastings & So. Houston, Tex. crudes—Oct. 1, '40—same as Humble Texas Gulf Coast except Pan Am. begins with Below 21 at $0.88.

Cayuga, Anderson Co., Tex.—Oct. 2, '39—$0.78.

CRUDE OIL PRICES (*Continued from preceding page*)

CALIFORNIA *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb 1, 1940

Gravity	Signal Hill (Long Beach) and others*	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda Brea Canon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley Canal	Coles Levee Richfield Western	Mountain View and others**	Elk Hills	Buena Vista Hills, Midway-Sunset, Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria Val. (Union Oil, Sept. 1 '39)
14-14.9	$0.65	$0.64	$0.63	$0.64	$0.65	$0.61	....	$0.65	$0.61	$0.61	$0.62	$0.63	....	....	....	$0.60	$0.60	$0.60	$0.60	$0.60	....	$0.42
15-15.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	.44
16-16.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	.45
17-17.9	.65	.64	.63	.68	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	.46
18-18.9	.65	.64	.63	.71	.65	.65	....	.68	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	.60	....	....
19-19.9	.69	.64	.67	.75	.70	.69	....	.72	.61	.65	.62	.63	....	....	....	.60	.64	.64	.64	.61	$0.60	....
20-20.9	.73	.64	.72	.79	.76	.74	....	.75	.65	.69	.62	.67	....	....	....	.60	.69	.69	.69	.62	.60	....
21-21.9	.78	.64	.76	.82	.81	.78	....	.79	.69	.73	.62	.72	$0.63	....	....	.64	.74	.74	.74	.66	.60	....
22-22.9	.82	.69	.81	.86	.86	.82	....	.82	.73	.77	.66	.76	.63	....	....	.68	.79	.79	.78	.70	.63	....
23-23.9	.86	.75	.85	.89	.92	.86	$0.71	.86	.78	.82	.71	.81	.67	....	....	.71	.84	.84	.82	.74	.67	....
24-24.9	.90	.80	.90	.93	.97	.90	.77	.89	.82	.86	.75	.85	.72	....	....	.75	.89	.89	.86	.78	.71	....
25-25.9	.95	.86	.94	.96	1.02	.95	.82	.93	.86	.90	.80	.89	.77	....	....	.79	.94	.94	.90	.82	.75	....
26-26.9	.99	.91	.99	1.00	1.08	.99	.88	.96	.90	.94	.84	.94	.82	....	....	.83	.99	.99	.95	....	....	....
27-27.9	1.03	.97	1.03	1.04	....	1.03	.94	1.00	.94	.98	.89	.98	.87	$0.83	$0.92	.87	1.04	1.04	.99	....	....	....
28-28.9	1.07	1.02	1.07	1.07	....	1.07	.99	1.03	.98	....	.93	1.02	.91	.86	.96	.91	1.09	1.09	1.03	....	....	....
29-29.9	1.10	1.07	1.11	1.10	....	1.10	1.04	1.06	1.02	....	.98	1.06	.96	.90	.99	.95	1.14	1.14	1.07	....	....	....
30-30.9	1.14	1.12	1.15	1.14	....	1.14	1.09	1.09	....	....	1.02	1.10	1.01	.94	1.02	.99	1.19	1.19	1.11	....	....	....
31-31.9	....	....	....	1.17		1.17	1.14	Elwood Terrace			1.07	1.14	1.05	.98	1.06	1.02	1.24	1.24				....
32-32.9	....	....	....	1.20		1.20	1.19	F. o. b. ship.			1.11	1.18	1.09	1.02	1.09	1.06	1.29	1.29	Kettleman Hills			....
33-33.9	....	....	....	....		....	1.24	....	$1.21	....	1.15	1.22	1.14	1.06	1.13	1.10	1.34	1.34	....	$1.12	....	....
34-34.9	....	....	....	....		....	1.29	....	1.25	....	1.20	1.26	1.19	1.10	1.16	1.14	....	....	....	1.17	....	....
35-35.9	....	....	....	....		....	1.34	....	1.29	....	1.24	....	1.23	1.14	1.20	....	....	....	....	1.21	....	....
36-36.9	....	....	....	....		....	1.39	....	1.33	....	1.28	....	1.27	1.18	1.23	....	....	....	....	1.25	....	....
37-37.9	....	....	....	....		....	1.44	....	1.37	....	1.33	....	1.31	1.22	1.26	....	....	....	....	1.29	....	....
38-38.9	....	....	....	....		....	1.49	....	....	....	1.37	....	1.36	1.25	1.30	....	....	....	....	1.33	....	....
39-39.9	....	....	....	....		....	1.54	....	....	....	1.42	....	....	1.29	1.34	....	....	....	....	1.38	....	....
40-40.9	....	....	....	....		....	1.59	....	....	....	1.46	....	....	1.33	1.37	....	....	....	....	....	....	....
41-41.9	....	....	....	....		....	....	....	....	....	1.50	....	....	1.37	1.40	....	....	....	....	....	....	....
42-42.9	....	....	....	....		....	....	....	....	....	1.54	....	....	1.41	1.44	....	....	....	....	....	....	....
43-43.9	....	....	....	....		....	....	....	....	....	1.59	....	....	1.45	1.47	....	....	....	....	....	....	....
44-44.9	....	....	....	....		....	....	....	....	....	1.63	....	....	1.49	1.51	....	....	....	....	....	....	....
45-45.9	....	....	....	....		....	....	....	....	....	1.67	....	....	1.53	1.54	....	....	....	....	....	....	....
46-46.9	....	....	....	....		....	....	....	....	....	1.71	....	....	1.57	1.57	....	....	....	....	....	....	....
47-47.9	....	....	....	....		....	....	....	....	....	....	....	....	1.61	....	....	....	....	....	....	....	....
48-48.9	....	....	....	....		....	....	....	....	....	....	....	....	1.64	....	....	....	....	....	....	....	....

FOB Standard Pipeline

*El Segundo prices same as Signal Hill. Wilmington prices same as Signal Hill, except below 19 gravity prices are: 14-16.9, $0.60; 17-17.9, $0.62; 18-18.9, $0.64.
**Includes Newhall, McKittrick, Kern River, Round Mountain and Kern Front, schedule for which ends with 19-19.9. Mountain View schedule begins with 19-19.9.

LOUISIANA-ARKANSAS

Posted by S O. Louisiana, Oct. 17, '40

Gravity	Bunkie, La. etc.	Caddo, La. etc.	Darrow, La. etc.	University, La. (Baton Rouge)	Atlanta, Ark. etc.
Below 21	....	....	$0.75	$0.91	$0.55
21-21.9	....	....	.77	.93	.57
22-22.9	....	....	.79	.95	.59
23-23.9	....	....	.81	.97	.61
24-24.9	....	....	.83	.99	.63
Below 25	$0.83	$0.73	....	....	....
25-25.9	.85	.75	.85	1.01	.65
26-26.9	.87	.77	.87	1.03	.67
27-27.9	.89	.79	.89	1.05	.69
28-28.9	.91	.81	.91	1.07	.71
29-29.9	.93	.83	.93	1.09	.73
30-30.9	.95	.85	.95	1.11	.75
31-31.9	.97	.87	.97	1.13	.77
32-32.9	.99	.89	.99	1.15	.79
33-33.9	1.01	.91	1.01	1.17	.81
34-34.9	1.03	.93	1.03	1.19	.83
35-35.9	1.04	.94	1.04	1.20	.84
36-36.9	1.05	.95	1.05	1.21	.85
37-37.9	1.06	.96	1.06	1.22	.86
38-38.9	1.07	.97	1.07	1.23	.87
39-39.9	1.08	.98	1.08	1.24	.88
40 & above	1.09	.99	1.09	1.25	.89

Bunkie, La. schedule includes Eola and Olla, La.

Caddo, La. schedule includes De Soto, Homer, Sabine & Sugar Creek, La., Fouke & Miller County, Ark.

Darrow, La. schedule includes, Bayou des Glaise, Bayou Mallet, Choctaw, Jeanerette, Lirette, No. Crowley, Port Barre, Potash, Roanoke & St. Martinville, La.

Atlanta, Ark. schedule includes Buckner, Magnolia, Village & Schuler (Jones Sand Oil), Ark.

Cotton Valley:
Crude..... $1.05
Distillate..... 1.10
Holloway Sand
Crude..... 1.10

Rodessa..... $1.05
Shreveport (Cross Lake)..... 1.05
Smackover (Heavy) .73
Dorcheat, Big Creek, & McKamie (Sour Distillates)..... .95

(*Continued in next column*)

LOUISIANA-ARKANSAS (Cont'd)

Posted by Shell Oil Co., Inc. (Aug. 29, '39)
Iowa District, La.

Below 18	$0.75	23-23.9	$0.89	29-29.9	$1.04
18-18.9	.77	24-24.9	.92	30-30.9	1.06
19-19.9	.79	25-25.9	.95	31-31.9	1.08
20-20.9	.81	26-26.9	.98	32-32.9	1.10
21-21.9	.83	27-27.9	1.00	33-33.9	1.12
22-22.9	.86	28-28.9	1.02	34 & above	1.14

Black Bayou & White Castle Districts, La.—same as Iowa District, except Black Bayou, etc. begins with Below 20 at $0.79.

Gibson Field, Terrebonne Parish, La..... $1.04
Happytown Field, St. Martin, Parish, La.
(Jan. 12, '40)..... 1.00

Posted by Arkansas Fuel Oil Corp.
Urania, La. (Oct. 14, '38)..... $0.89

Posted by Continental Oil Co.
Tepetate & Ville Platte, La. (Oct. 11, '38).... $1.03

Abbeville, La. (Jan. 1, '39)

Below 36	$0.92	37-37.9	$0.96	39-39.9	$1.00
36-36.9	.94	38-38.9	.98	40 & above	1.02

Posted by Caddo Crude Oil Purchasing Corp.
Allison area, Shrv'prt. field (Aug. 14, '39)..... $0.95

Lisbon, N. La. (Sept. 14, '39)

27-27.9	$0.66	30-30.9	$0.72	33-33.9	$0.78
28-28.9	.68	31-31.9	.74	34-34.9	.80
29-29.9	.70	32-32.9	.76	35 & above	.82

CANADIAN FIELDS

Posted by Imperial Oil Limited
Western Ontario (Nov. 6, 1939)

Petrolia..... $2.10 Oil Springs..... $2.17

Turner Valley (Prices FOB producer's tankage) Crude Oil (Sept. 12, 1940)

33-33.9	$1.08	44-44.9	$1.30	55-55.9	$1.52
34-34.9	1.10	45-45.9	1.32	56-56.9	1.54
35-35.9	1.12	46-46.9	1.34	57-57.9	1.56
36-36.9	1.14	47-47.9	1.36	58-58.9	1.58
37-37.9	1.16	48-48.9	1.38	59-59.9	1.60
38-38.9	1.18	49-49.9	1.40	60-60.9	1.62
39-39.9	1.20	50-50.9	1.42	61-61.9	1.64
40-40.9	1.22	51-51.9	1.44	62-62.9	1.66
41-41.9	1.24	52-52.9	1.46	63-63.9	1.68
42-42.9	1.26	53-53.9	1.48	64 & over	1.70
43-43.9	1.28	54-54.9	1.50		

Absorption Gasoline (Jan. 5, 1938)
90% Rec., 20 lb. Reid v.p..... $1.94
90% Rec. 17 lb. Reid v.p..... $2.08

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co. (Oct. 11, '38)

Salt Creek (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as S. O. Indiana posts in Okla.-Kans., ranging from $0.86 to $1.10, which see in next column.

Tensleep crude	$0.646	Frannie, light	$0.55
Hes, heavy	.92	Grass Creek, hea y	.40
Elk Basin, light	.90	Hamilton Dome, Wyo.	.35
Grass Creek, light	.90	Frannie, heavy	.42

Posted by Ohio Oil Co. (Oct. 11, '38)

Elk Basin, Wyo.	$0.90	Rock Creek	$1.00
Grass Creek, light	.90	Lance Creek	.77

Dry Creek, Mont..... .92
Grass Creek, heavy (April 1, '39)..... .40
Sunburst, Mont. (Nov. 16, '37)..... .90

Posted by Continental Oil Co. (Oct. 11, '38)
Ft. Collins & Wellington, Col.

Below 29	$0.81	32-32.9	$0.89	36-36.9	$0.97
29-29.9	.83	33-33.9	.91	37-37.9	.99
30-30.9	.85	34-34.9	.93	38-38.9	1.01
31-31.9	.87	35-35.9	.95	39-39.9	1.03
				40 & above	1.05

Canon City & Florence, Col	$0.90	Big Muddy, Wyo.	$0.98
Cat Creek, Mont.	1.10	Lance Creek, Wyo.	0.77

CLASSIFIED

Address all Blind Box Number ads to National Petroleum News, 530 Penton Building, Cleveland, Ohio, unless otherwise specified.

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All types and sizes used gasoline transports that were traded in for new and larger equipment. Write, telephone or wire your requirements to G. E. Bobbitt, Raleigh, North Carolina.

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Available, Chemical Engineer with thirty-five years of technical, administrative and executive experience, mostly in the Petroleum Industry. Box No. 831.

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MAJOR OIL, JOBBER OR EQUIPMENT MFG. Have had ten years experience with automobile manufacture, ten years experience major oil company, Chicago and Wisconsin markets as district manager, responsible twenty bulk plants, ten salesmen, eight jobbers, three hundred service stations. Doubled territory gallonage in past three years. Capable of building new sales program that brings results. Desire to make connection with major oil company or large jobber or service station equipment manufacturer. Free to locate anywhere. Can furnish A-1 reference. Address—Box 303—6026 N. Winthrop Ave.—Chicago, Ill.

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Highway transportation of gasoline and oils is a fast growing development requiring specialized safety equipment. Leading manufacturer of most highly engineered, advance design, nationally advertised, nationally sold Truck Tanks and Transports needs good salesmen or sales engineers to follow through and intensively work Florida, Alabama, Louisiana and Mississippi territories. Performance records of these transport units sold to fleet operators in this territory for a number of years afford good selling background. Large unit sales offer big earning possibilities. Prefer men now calling upon and acquainted with oil companies but who are selling non-conflicting line. Address Box No. 828 giving full information.

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"For Sale," "Wanted to buy," "Help Wanted," "Business Opportunities," "Miscellaneous" classifications, set in type this size without border—10 cents a word. Minimum charge, $3.00 per insertion.

"Position Wanted"—5 cents a word. Minimum charge $1.00 per insertion.

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· PERSONALS ·

Members of the Chicago Oil Men's Club have elected the following officers for the coming year: president, **Charles J. Wood,** sales manager, Harry P. Dunn Co.; vice-president, **Holger Jensen,** vice-president and sales manager, Spencer Petroleum Co.; secretary, **Karl F. Holdefer,** secretary, Commerce Petroleum Co.; and treasurer, **J. Glenn Phinney,** sales dept., Cities Service Oil Co.

Following directors were named for 1941: **William G. "Bill" Franke,** sales manager, American Mexican Petroleum Co.; **Roy Curran,** president, Suburban Oil Co.; **R. G. Satterly,** Arrow Petroleum Co.; **George N. Olson,** president, George N. Olson Co.; and **M. W. Prellberg,** James B. Berry Sons' Co.

The annual Christmas party will be held Dec. 19 in the Club rooms.

* * *

Robert L. Phillippi, Los Angeles, public relations and advertising director for Union Oil Co. of California, has been elected to membership in the National Assn. of Accredited Publicity Directors. This is one of highest honors conferred upon public relations executives, as the N.A.A.P.D. is the reported public relations counterpart of the bar and medical associations. One of the requirements is five or more years as publicity or public relations director.

* * *

Dr. Eugene A. Stephenson, Lawrence, Kans., head of the petroleum engineering department of the University of Kansas, has been elected chairman of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers. Dr. Stephenson is also a member of the engineering committee of the Interstate Oil Compact Commission.

* * *

Jerry Sadler, Texas Railroad Commission's flying member, has filled out a questionnaire for a local draft board further scrambling the commission's future status. (NPN, Nov. 27, 1940, p. 15) As Mr. Sadler is married, he would be exempt. His previous military experience was with the cavalry.

Meanwhile **Col. Ernest O. Thompson** reveals that he has been pronounced in A-1 condition by examining medical officers. Because of delay in camp construction, Col. Thompson's regiment has been held up, but is due to leave for Brownwood, Tex., today, Dec. 11.

* * *

Sheldon Clark, Chicago, vice-president of Consolidated Oil Corp., has been elected president of the Navy League of the United States. Mr. Clark's interest in naval matters dates back many years. He is president of the Navy Council of Illinois, national commodore of the Sea Scouts and Boy Scouts of America, as well as being commodore of the Yachtsmen's Assn. of America.

* * *

M. H. Champion, Oklahoma City, traffic manager for Anderson-Prichard Oil Corp. and Col-tex Refining Co., and president of Petroleum Rail Shippers Assn., has resigned as traffic manager of these companies, effective Dec. 1. He will continue as P.R.S.A. president.

In a statement released at Oklahoma City, it was said that Mr. Champion was uncertain about future plans and would "do some farming and loafing." He will also continue to represent the two refining companies in rate case (ICC 28106),—asking for equable transportation charges—now pending. Mr. Champion has been in industrial traffic work for 33 years, 12 years with U. S. railroads, 2 years abroad, and 19 years with the Anderson-Prichard companies.

M. H. Champion

L. M. Woodward, Wichita, office manager of Derby Oil Co., recently took a 10-day trip through the "Sunny South"; but reports say that it was not so sunny, as rain and clouds made it "unusual"—copyright term for bad weather in Southern California.

* * *

Harry A. Prewitt, Liberal, Kans., agent for the K-T Oil Corp., and a director of Kansas Oil Men's Assn., has been confined to the hospital for past several weeks, but it is expected he will soon leave for home.

* * *

At a recent meeting of the Southwestern Assn. of Industrial Editors, **Luther Williams,** Tulsa, editor of The Diamond of Mid-Continent Petroleum Co., spoke on "Sales and Institutional House Organs," and Paul E. Yard, Tulsa, Diamond's art director, headed a discussion on publication layout. **Miles Schull, Jr.,** El Dorado, Ark., public relations manager of Lion Oil Refining Co., spoke on "The Employee House Organ."

* * *

Berkley Bunker, Las Vegas, Nev., has been appointed by Nevada's governor to take his seat as a member of the U. S. Senate, succeeding the late Nevada Senator Key Pittman, Mr. Bunker leases a Texaco service station in Las Vegas, is 34 years old and a bishop of the Mormon church. He has been a member of the Nevada legislature since 1936, and speaker of the House in 1939. As former Senator Pittman was re-elected in the last general election, Mr. Bunker will probably serve in the senate until Nevada holds its next general election in 1942.

* * *

Stork, Inc., visited **Mr. and Mrs. J. M. Cook,** Houston, Nov. 28, leaving a 7.5-lb. baby boy whom they have named Donald Martin Cook. Mr. Cook is sales manager of American Petroleum Co., Houston.

* * *

W. F. Clinger, Tidioute, Pa., Clinger Oil and Gas Co., has been named a member of Production Advisory Committee of Pennsylvania Grade Crude Oil Assn.

* * *

Buffalo gets cold in the winter, so **George K. Hambleton,** president, Hambleton Terminal Corp., bundles up the family, Mrs. Hambleton and two children, and packs them off to Florida. George "commutes" by plane.